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Original Research

Improving Diabetes-Mellitus Self-Care Practice Using Educational Video in Preventing COVID-19 (EPIC-19) during the Pandemic

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Abstract

Introduction: Diabetes is declared as a comorbidity for COVID-19 infection. It has high susceptibility due to chronic hyperglycemia that would impact the immune dysfunction among its survivors. Proper health education has been widely reported as an effective method to improve knowledge about diabetes management. Further, media in the form of video may offer an effective way to deliver this information. Thus, this study aimed to investigate the effect of an Educational Video in Preventing COVID-19 Infection (EPIC-19) on self-care practices among diabetes mellitus patients during the pandemic.
Methods: This study employed a quasi-experimental design with a one-group pretest-posttest design. All diabetes mellitus patients with diabetic ulcers in the area of East Denpasar District, Denpasar City, were included as the study population. A total of 36 eligible participants were finally selected using a consecutive sampling technique. This study enrolled a modified version of a Summary Diabetes Self-Care Activities (SDSCA) questionnaire. Several statements in the questionnaire were adjusted to measure the self-care practices in preventing COVID-19 infection. The data analysis then conducted using the Wilcoxon Test with an alpha of 0.05.
Results: Findings revealed a significant effect of the EPIC-19 on self-care practices in preventing COVID-19 infection, with a p-value of 0.0001 ($p < 0.05$).
Conclusion: Video is extensively offered as a medium to disseminate health information during the pandemic. In addition to its attractive form, video enables patients to grasp health information easier.

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INTRODUCTION

The World Health Organization (WHO) announced Coronavirus disease 2019 (COVID-19) as a global pandemic in March 2020. COVID-19 is caused by a virus known as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) [1]. Individuals with diabetes mellitus are exposed to a higher risk of transmission of COVID-19. Further, it is also established as one of the comorbidities of COVID-19 infection [2]. In 2021, the diabetes rate in Indonesia ranked fifth in the world's most diabetes cases. Recently, around 19.46 million people in Indonesia had been diagnosed with diabetes [3]. Diabetes survivors are prone to COVID-19 infection due to their chronic hyperglycemia state that could affect immune dysfunction.

Several health initiatives could be conducted to prevent and minimize the risk of COVID-19 transmission. Glycemic control is vital to control the COVID-19 risk of infection. Adequate self-care practice among diabetes mellitus patients associates with better glycemic control that could manage chronic hyperglycemia [4][5][6]. Further, proper self-care practices would prevent the emergence of diabetes complications, generating a better quality of life. Health education has been broadly reported as a sufficient effort to enhance diabetes self-care practices [7]. An increase in health knowledge links with an improvement in health attitude and behavior domain of self-care practice.

Our national government, through the Health Ministry, has been actively disseminating health information about COVID 19 prevention for diabetes survivors. This information is expected to be shared through health service providers in all regions of Indonesia. However, due to the fear of getting infected, diabetes patients rarely visited these health providers, leaving this effort in vain. This situation was clearly depicted by the number of deaths due to the COVID-19 infection from the official government website (COVID19.go.id). Almost ten percent of deaths (9.8%) were confirmed as COVID-19 patients with diabetes comorbidity.

Optimizing the prevention efforts of COVID-19 infection in diabetes patients in a more effective and efficient way demands serious attention [8]. Therefore, we are intrigued to organize an Educational Video to Prevent COVID-19 Infection (EPIC-19) in improving self-care practice among diabetes patients during the pandemic. Educational video is defined as media of teaching that incorporated the element of audio-visual such as animated pictures and sound, presenting a more attractive way to convey information. This study aimed to investigate the effect of EPIC-19 on self-care practices among diabetes mellitus patients during the pandemic. Findings are expected to provide scientific evidence of effective media for health information dissemination targeting diabetes mellitus patients and reduce morbidity/mortality rates due to COVID-19 infection, primarily in vulnerable groups, such as diabetes patients.

METHODS

This study employed a quasi-experimental design with a one-group pretest-posttest

design approach. The independent variable was the administration of EPIC-19. The information in the video was organized systematically according to diabetes self-management information elaborated in the American Diabetes Association Guidelines (2020) and PERKENI (The Indonesian Association of Endocrinology's) Guidelines (2020). COVID-19 prevention information from the Revised Guidelines for Prevention and Control of Corona Virus Disease (COVID-19) (2020) was also included in the video. The video feasibility assessment was initially examined by experts from multiple backgrounds, especially from technology and information system science and health professionals, assuring the video quality before being given to the participants.

The dependent variable was self-care practices. This variable was measured using a Summary Diabetes Self-care Activities (SDSCA) questionnaire. Several items in the questionnaire were adjusted to identify the behavior in preventing COVID-19 infection, transmission, and method of prevention [9][10]. The SDSCA questionnaire has been tested widely for its validity and reliability in several countries. However, in a recent study, two endocrinologists were asked to assess the questionnaire validity (face validity) due to demographic characteristics and cultural atmosphere differences in Bali. SPSS 2.0 was applied to conduct the statistical analysis of the collected data. Univariate analysis enrolled to portray each variable characteristics through the descriptive statistic. Bivariate analysis (Wilcoxon Test) was also enrolled to establish the effect of EPIC-19 on self-care practice among the participants. The study was conducted in a Public Health Center situated in Denpasar City area. All diabetes mellitus patients who visited this local health center, with a total of 97 patients, were considered as the study population. Using a consecutive sampling approach and the Slovin formula with a specified margin error of 5 % or 0,05, the final number of eligible participants recruited was 36. The inclusion criteria included: (1) diagnosed with type 2 diabetes, and (2) owned and able to use mobile phones. However, those with visual/hearing impairments and had grade 3 to 4-foot diabetic ulcers were excluded from the study. The ethical permission for the study has been granted through an ethical clearance with the number of: 03.0480/KEPITEKESBALI/VII/2022.

The univariate analysis specified the variable's characteristics: age, gender, educational background, duration of type 2 diabetes mellitus, and self-care level. The bivariate analysis established the effect of EPIC-19 on the self-care practice among the participants. SPSS for windows version 20 and the Wilcoxon test applied in the final statistical analysis with a 95% confidence interval or a p-value < 5% alpha (<0.05). Ho was rejected with a 95% CI.

RESULTS

Findings were classified according to the statistical analysis: univariate and bivariate. The univariate analysis depicted the participant's characteristics: age, gender, educational background, duration of diabetes mellitus type 2, and self-care practice level.

Bivariate analysis established the effect of EPIC-19 on self-care practices among diabetes mellitus patients during the pandemic.

Participant's Characteristics

Table 1 presents the participant's characteristics. Findings reported that the majority of participants were aged between 51 to 60 years (58.3%), male (58.3%), graduated from college/university (52.8%), and had been diagnosed with diabetes for more than five years (63.9%).

Table 2 reveals the level of self-care practice among the participants. The self-care practice was classified according to the Bloom Cut Point: good/high, moderate, and poor. The category of good, moderate, and poor were characterized by the total score of 80% to 100% (13.6–17 points, 60% to 79% (10.2-13.6 points), and less than 60% (<10.2 points), respectively [8]. Table 2 reveals that the majority of participants showed a poor level of self-care practice before the intervention (26; 72.2%). Only 8 (5.6%) and 2 (22.2 %) participants showed moderate and good self-care practices, respectively. However, 32 participants demonstrated good self-care practices (88.9%) after the intervention. Four participants (11.1%) identified with a moderate level of self-care practices, and none demonstrated a poor level of self-care practice.

Effect of EPIC-19 on Diabetes Self-Care Practices during the Pandemic

Wilcoxon statistical analysis test was applied to analyze the effect of EPIC-19 in improving self-care practices. Self-care practices evaluation was conducted before and after the intervention. Statistical analysis revealed a p-value of 0.000 ($p < 0.05$). Therefore, Ho was rejected. Thus, confirming the effect of EPIC-19 video on self-care practices among diabetes mellitus patients to prevent COVID-19 infection.

Table 1

Participant's Characteristics

Category	Frequency (f)	Percentage (%)
Gender		
Male	21	58.3
Female	15	41.71
Age		
31 – 40	7	19.4
41 – 50	8	22.2
51 – 60	21	58.3
Educational Background		
Primary school	1	2,8
Junior high school	5	13.9
Senior high school	11	30.6
College/university	19	52.8
Duration of Diabetes Mellitus		
<5 years	13	36.1
>5 years	23	63.9

Table 2

Distribution of the Level of Self-Care Practice

Variable	EPIC-19			
	Pretest		Posttest	
Self-Care	n	%	n	%
High	2	5.6	32	88.9
Moderate	8	22.2	4	11.1
Poor	26	72.2	0	0
Total	**36**	**100**	**36**	**100**

Table 3

The Level of Self-Care Practice in the Pretest and Posttest

	Mean		p-value
EPIC-19	**Pretest**	**Posttest**	0.000
	43.61	91.61	

DISCUSSION

Effect of EPIC-19 on Diabetes Self-Care Practice in Preventing of COVID-19 Infection among Diabetes Mellitus Patients

A p-value of 0.000 was confirmed by the result from the statistical analysis ($p < 0.05$). Thus, establishing the significant effect of EPIC-19 on self-care practices in preventing COVID-19 infection among diabetes patients. An increase in the level of self-care practices after the intervention was also documented in the current study. EPIC-19 combined moving animations and verbal explanations about COVID-19 prevention for diabetes patients. The content of the video was prepared according to Diabetes Self-Management Education (DSME) and Guidelines for Prevention and Control of Corona Virus Disease (COVID-19): The 4th Revision 2020 [3] [10]. The EPIC-19, which was developed in an audio-visual learning file, could be accessed through a personal mobile phone, providing convenient access to the patients to receive and recall the health information.

These findings were in line with other studies that mentioned an increase in COVID infection prevention behavior in the community after being given an educational video media [18]. In the current study, we aimed to evaluate the effect of educational videos on COVID-19 prevention behavior. Findings also reported a higher level of self-care practice after the intervention. Another study about health educational videos also supported this finding. They found significant changes in the health attitudes domain, before and after the intervention [19].

Educational video influences a person's behavior in complying with health protocols. There was a significant effect of the use of educational video on compliance with the local "5M" protocols introduced as self-protection protocols for COVID-19 infection in the community. Video is an audio-visual media that could be used in delivering health information. The combination between the audio and visual feature may appear more attractive and captures more attention [20]. The recent study found that the majority of participants (72.2%) had a low level of self-care practice in the pretest session.

Health information packed in a form of an educational video provided more flexible access to the patients. Patients could access the information everywhere, including in their homes. This situation is beneficial for their self-care practice improvement, as confirmed by an increase in self-care practice after the intervention. The majority of participants (88.9%) were demonstrating a high level of self-care practice in the posttest session. Further, none of them were identified with poor self-care practices. An educational video can increase patients' enthusiasm in receiving health information that would improve the level of their knowledge eventually [21]. The increase in knowledge level may occur due to the interest level, sense of inquisitiveness, and curiosity acquired from the videos and can emphasize important information for the participants to know [22].

In the current study, the video was designed with moving animations complemented by several sound effects,

enabling participants with visual impairments to acquire information from the video. Video can be used as an educational medium, stimulating thoughts, feelings, attention, creativity, and innovation. Also, provides a direct experience to the audience during the learning process. The learning process entangles more than one sense. Thus, more stimulation to the senses would improve the process of information acceptance and retention [23].

Participant's Characteristics

The majority of participants (58.3%) were aged between 51 to 60 years. The findings in this study were in line with other studies that also discovered that people aged >45 years posed nine times higher risk of developing type 2 diabetes mellitus compared to people aged <45 years [11]. These findings were also supported by a study that enrolled 134 participants. They reported that the majority of type 2 diabetes mellitus survivors were aged 46-65 years (69.4%) [12]. Older age will influence the metabolism system and capability. The aging process can have an impact on lower insulin sensitivity and changes in insulin production. Aging also causes a decrease on compensatory mechanism in pancreatic β-cell protein that is insufficient to manage the increasing rate of insulin resistance [13]. According to the American Diabetes Association (ADA), diabetes mellitus could link to risk factors that cannot be changed, including the family history of diabetes mellitus (first-degree relative) and age ≥45 years. The prevalence of diabetes mellitus in the older age group is three times higher than the younger group.

Most of the participants in this study were male diabetes patients. In fact, no significant correlation between gender and the incidence of type 2 diabetes mellitus had been documented in previous studies. Due to miscellaneous factors such as habits and daily lifestyle, males and females encounter an equal risk of developing diabetes mellitus [12]. No correlation between gender and blood sugar level was also recognized among the diabetes survivors in the previous studies. Additionally, studies have been reporting varied results regarding the effect of gender on blood sugar levels. Hence, male and female diabetes survivors pose a similar risk of high blood sugar levels. The changes in sugar levels may occur due to other factors [14].

The majority of participants graduated from college/university (52.8%). In contrast with the findings in the recent study, previous studies demonstrated the association between a lower level of educational background with a higher risk of developing diabetes mellitus [15]. However, other studies also stated no connection between education level and the occurrence of type 2 diabetes mellitus [16]. A person with a higher level of education tends to be associated with tighter-everyday-schedules. This situation may contribute to a more sedentary lifestyle and unhealthy eating habits that affect their health.

Most participants had been diagnosed with diabetes mellitus for more than five years (63.9%). The duration of diabetes will associate with the glucose-hemoglobin binding duration that slowly causes chronic hyperglycemia. Chronic hyperglycemia state

triggers micro-macrovascular disorders, which is a factor in diabetes complications [17]. This finding was in line with other studies that discussed the correlation between self-care practice, glycemic index, and diabetic ulcers. In that study, the majority of participants (58.3%) had been diagnosed with diabetes mellitus for > 5 years [6].

STUDY LIMITATION

No evaluation of blood sugar levels before and after the intervention was conducted, whereas blood sugar levels could contribute as a proper self-care control indicator among diabetes mellitus patients. Thus, in the future study, the investigation of the effectiveness of EPIC-19 on glycemic index changes among diabetes mellitus patients is highly advised to complement the recent findings. In addition, the number of participants in this study was quite limited. It may not depict the entire self-care practices. The pandemic has confined the data collection, including the participant screening process. The number of visits to the Public Health Center was relatively low due to the fear of COVID-19 transmission.

CONCLUSION AND RECOMMENDATION

The majority of participants showed a high level of self-care practice in the posttest. This finding suggests the need for health education media development to assist the process of health information delivery, facilitating the role of nurses as educators in the community. The incorporation of audio and visual elements in an educational video may attract more attention and focus to engage with the health information.

Besides that, the videos used in this study can be accessed at a more flexible time, anytime and anywhere, offering convenient access to recall information about COVID-19 infection prevention. Further studies are required to compare the effect of conventional and audio-visual health education media on self-care practices, as these findings, concurrently, would contribute to the decision-making process of proper media for health information dissemination among diabetes mellitus patients.

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CONFLICT OF INTEREST

The authors declare no conflict of interest in this study.

REFERENCES

[1] PDPI, PERKI, PAPDI, PERDATIN, and IDAI, Pedoman tatalaksana COVID-19 Edisi 3 Desember 2020. 2020.

[2] P. A. L. Roeroe, B. P. Sedli, and O. Umboh, “Faktor Risiko Terjadinya Coronavirus Disease 2019 (COVID-19) pada Penyandang Diabetes Melitus Tipe 2,” e-

CliniC, vol. 9, no. 1, pp. 154–160, 2021, doi: 10.35790/ecl.v9i1.32301.

[3] IDF, IDF Diabetes Atlas (Internet). 2021.

[4] A. A. Hai, S. Iftikhar, S. Latif, F. Herekar, and M. J. Patel, "Diabetes Self-care Activities and Their Relation with Glycemic Control in Patients Presenting to The Indus Hospital, Karachi," Cureus, vol. 11, no. 12, 2019, doi: 10.7759/cureus.6297.

[5] D. Prabawati and L. Natalia, "The Effectiveness of Self-Care Model on Diabetes Self-Management Behaviour," Indones. Nurs. J. Educ. Clin., vol. 5, no. 1, p. 1, 2020, doi: 10.24990/injec.v5i1.277.

[6] S. D. Megayanti, Y. Yulia, and R. Maria, "Correlation of Diabetes Self Care, Pedis Score and Glycemic Control in Diabetes Mellitus.," J. Keperawatan Indones., vol. 22, no. 2, pp. 122–128, 2019, doi: 10.7454/jki.v22i2.795.

[7] N. Kugbey, K. Oppong Asante, and K. Adulai, "Illness perception, diabetes knowledge and self-care practices among type-2 diabetes patients: A cross-sectional study," BMC Res. Notes, vol. 10, no. 1, pp. 1–7, 2017, doi: 10.1186/s13104-017-2707-5.

[8] G. M. Taye et al., "COVID-19 knowledge, attitudes, and prevention practices among people with hypertension and diabetes mellitus attending public health facilities in Ambo, Ethiopia," Infect. Drug Resist., vol. 13, no. November, pp. 4203–4214, 2020, doi: 10.2147/IDR.S283999.

[9] WHO, World Health Organization : World Health Statistics 2020, Monitoring Health For The SDGs, vol. 21, no. 1. 2020.

[10] Satuan Tugas Penanganan COVID-19, "Satuan Tugas Penanganan COVID-19," Satgas COVID -19, vol. 2019, p. 1, 2021, [Online]. Available: https://COVID19.go.id/.

[11] K. Komariah and S. Rahayu, "Hubungan Usia, Jenis Kelamin Dan Indeks Massa Tubuh Dengan Kadar Gula Darah Puasa Pada Pasien Diabetes Melitus Tipe 2 Di Klinik Pratama Rawat Jalan Proklamasi, Depok, Jawa Barat," J. Kesehat. Kusuma Husada, no. Dm, pp. 41–50, 2020, doi: 10.34035/jk.v11i1.412.

[12] S. Gunawan and R. Rahmawati, "Hubungan Usia, Jenis Kelamin dan Hipertensi dengan Kejadian Diabetes Mellitus Tipe 2 di Puskesmas Tugu Kecamatan Cimanggis Kota Depok Tahun 2019," ARKESMAS (Arsip Kesehat. Masyarakat), vol. 6, no. 1, pp. 15–22, 2021, doi: 10.22236/arkesmas.v6i1.5829.

[13] R. Bilous, R & Donelly, Diabetes Handbook. linguist, Yudha K editor of Indonesian edition, Bariid B, Ed 4. Jakarta: Bumi Medika, 2015.

[14] A. Boku, "Faktor-faktor yang Berhubungan Terhadap Kadar Gula Darah Pada Penderita Diabetes Melitus Tipe II di RS PKU Muhammadiyah Yogyakarta," Naskah Publ. Yogyakarta Fak. Ilmu Kesehatan. Univ. 'Aisyiyah., 2019.

[15] A. Pahlawati and P. S. Nugroho, "Hubungan Tingkat Pendidikan dan Usia dengan Kejadian Diabetes Melitus di Wilayah Kerja Puskesmas Palaran Kota Samarinda Tahun 2019," Borneo Student Res., vol. 1, no. 1, pp. 1–5, 2019, [Online].

Available: http://journals.umkt.ac.id/index.php/bsr/article/view/479.

[16] Isabella, Mamangkey, N. H. . Kapantow, and B. T. . Ratag, "Hubungan antara tingkat pendidikan dan riwayat keluarga menderita dm dengan kejadian dm tipe 2 pada pasien rawat jalan di poliklinik penyakit dalam BLU RSUP Prof. dr. r. Kandou Manado," Fak. Kesehat. Masy. Univ. Sam Ratulangi, pp. 1–6, 2014.

[17] S. Zoungas et al., "Impact of age, age at diagnosis and duration of diabetes on the risk of macrovascular and microvascular complications and death in type 2 diabetes," Diabetologia, vol. 57, no. 12, pp. 2465–2474, 2014, doi: 10.1007/s00125-014-3369-7.

[18] L. A. Rahmatina and M. Erawati, "Evaluasi Program Edukasi dengan Video dan Poster Terhadap Perilaku Masyarakat dalam Menghadapi COVID-19 (Preliminary Study)," Holist. Nurs. Heal. Sci., vol. 3, no. 1, pp. 9–16, 2020, doi: 10.14710/hnhs.3.1.2020.9-16.

[19] Y. Lestari, N. Nurhaeni, and H. Hayati, "Penerapan Mobile Video Efektif Meningkatkan Pengetahuan Dan Sikap Ibu Dalam Menurunkan Lama Diare Balita Di Wilayah Puskesmas Kedaton Bandar Lampung," J. Keperawatan Indones., vol. 21, no. 1, pp. 34–42, 2018, doi: 10.7454/jki.v21i1.546.

[20] P. A. Sulistiani and S. Riani, "MANFAAT EDUKASI BERBASIS VIDEO TERHADAP TINGKAT KEPATUHAN 5M SEBAGAI SELF PROTECTION COVID-19," vol. 4, no. 2, pp. 74–81, 2022.

[21] S. D. Megayanti, "Development Of Diabetes Self-Care Management Using Audio-Visual Media," J. Kesehat. dr. Soebandi, vol. 9, no. 1, pp. 38–45, 2021, doi: 10.36858/jkds.v9i1.263.

[22] A. N. R. Saragih and L. S. Andayani, "Pengaruh Promosi Kesehatan dengan Media Video dan Booklet terhadap Pengetahuan Siswa mengenai Perilaku Sedentari di MAN 1 Medan," Perilaku dan Promosi Kesehat. Indones. J. Heal. Promot. Behav., vol. 4, no. 1, p. 47, 2022, doi: 10.47034/ppk.v4i1.5996.

[23] Bili et al., "Pengaruh Pendidikan Kesehatan Dengan Audio Visual Terhadap Perilaku Pencegahan Penularan Padakeluarga Dengan Tuberkulosis Paru Di Wilayah Kerja Puskesmas Sikumana," Chmk Heal. J., vol. 3, no. 2, pp. 20–26, 2019, [Online]. Available: https://ojs.stkippgri-lubuklinggau.ac.id/index.php/JPP/article/view/77.