

The Effect of Education Using Booklet Media on Knowledge of Controlling Blood Sugar Levels in Type 2 Diabetes Mellitus Patients

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Abstract. Non-communicable diseases (NCDs) have now become a serious threat to global health, one of these NCDs is Diabetes Mellitus. Diabetes mellitus is a chronic disease where blood sugar levels are unbalanced due to disturbances in the insulin hormone. Education is a learning process towards change for the better in each individual. The process is ongoing and progress must be continuously monitored. The health education aims to increase knowledge about controlling blood sugar in diabetes mellitus. Increased knowledge can be seen in changes in lifestyle and attitudes which ultimately shape changes in behavior in society and the quality of life of diabetes patients. Booklet learning media is a book tool that is equipped with pictures and writing adapted to the reader. The information in the booklet is arranged clearly and in detail so that it can be well understood by the educational target. The aim is to find out the effect of education using booklet media on knowledge of controlling blood sugar levels in Type 2 diabetes mellitus patients. Method This research uses a quasi-experimental design method (quasi-experiment). The research design is One Group Pretest-Posttest Design with a total of 40 respondents. The results of the paired t-test show the effect of education on knowledge of controlling blood sugar levels based on the T count > 9.153 compared to the T table value of 2.0563 and P value < 0.05 so that there is an increase in understanding regarding knowledge of controlling blood sugar level

Keywords: Diabetes mellitus, Blood sugar control education, Booklet media

INTRODUCTION

Non-Communicable Diseases (NCDs) have now become a serious threat to global health, one of these PTMs is Diabetes Mellitus (Kemenkes RI, 2019). Diabetes mellitus is a chronic disease where blood sugar levels are unbalanced due to disturbances in the insulin hormone where the body is unable to produce enough insulin or the sufferer cannot produce insulin at all (Dewi, 2022).

Reporting data from the International Diabetes Federation (IDF) organization records that the total number of DM sufferers reached 463 million people aged 20-79 years in the world, or the equivalent of a prevalence of 9.3% of the population in 2019. The prevalence of diabetes is estimated to increase as the age of the population increases to 19.9% or 111.2 million people aged 65-79 years. The figure is predicted to continue to increase until it reaches 578 million in 2030 and 700 million in 2045. (InfoDATin, 2020). According to basic health results research (Kemenkes RI, 2018), in 2018 the prevalence of diabetes mellitus in Indonesia was 1,017 million people, with the highest number of sufferers aged 65-75 years (6.03%). In 2018, Central Java province w Complications that can occur in people with type 2 diabetes mellitus include serious changes in the heart, nerves, kidneys and eyes. DM sufferers will experience various long-term complications if their diabetes is not managed properly (Ratna Dewi Pudiasuti, 2013). Hyperglycemia can be treated with diet and exercise. Diet is planning what to eat, when to eat, determining how much to eat. The aim of the diet itself is that blood sugar is controlled, blood fat is within normal limits, blood pressure is not high, body weight is not excessive, diabetes complications do not occur and can be managed. The participation of families, patients and the community is very much needed, and is accompanied by the health team to achieve healthy behavior. To achieve successful behavior change, comprehensive education and efforts to increase motivation are needed (Windani et al., n.d.).

Education is a learning process towards change for the better in each individual. The process is ongoing and progress must be continuously monitored. The health education aims to increase knowledge about controlling blood sugar in diabetes mellitus. Increased knowledge can be seen in changes in lifestyle and attitudes which ultimately shape changes in behavior in society and the quality of life of diabetes patients (Umat *et al.*, 2022). Sufferers' knowledge about DM is also important, considering that quite a few DM sufferers lack an understanding of DM. As a result of not understanding DM, many DM sufferers are unable to carry out self-care in controlling blood sugar, resulting in complications and causing the disease to get worse. Self care activity is a planned individual action in order to control illness to maintain and improve health status and well-being (Muhlisin & Irdawati, 2010).

Fitri Suciana (2019) stated that there are 5 main pillars of treatment for type 2 DM patients, namely education, medical nutrition diet, physical exercise, pharmacological drugs and monitoring blood sugar levels. Education plays a very important role in the management of type 2 DM because providing education to patients can change patient behavior in self-care for diabetes mellitus. Changing behavior in people with diabetes is not easy, continuous motivation is needed. Risk factors for DM that can be controlled are obesity, hypertension, history of heart disease, dyslipidemia, lack of physical activity and an unbalanced diet. Diabetes can be controlled by maintaining a balanced eating pattern/diet. Non-adherence to a prescribed diet is one of the contributors to failure in DM treatment (Aminah *et al.*, 2022) with a total of 1.6% was ranked 3rd after West Java and East Java provinces (Litbangkes, 2018).

Booklet learning media is a book tool that is equipped with pictures and writing adapted to the reader. The information in the booklet is arranged clearly and in detail so that it can be captured well by educational targets and does not cause misperceptions, besides that the attractive images in the booklet will make it more interesting to read and focus on the information presented (Pralisaputri K R *et al.*, 2016). It is hoped that education using booklet media can increase knowledge of controlling blood sugar levels in Diabetes Mellitus sufferers.

METHODS

This research uses a quasi-experimental design method (*quasi-experiment*). The research *design is One Group Pretest-Posttest Design*. In this design there is a pretest before treatment and a posttest after treatment. In this way, the results of the treatment can be known more accurately, because it can be compared with the situation before the treatment was given (Notoatmodjo Soekidjo, 2018).

RESULTS AND DISCUSSION

Based on the results of data collection carried out by researchers through distributing questionnaires to 40 respondents at the Ngemplak Community Health Center. The influence of education using booklet media on knowledge of controlling blood sugar levels in Type 2 diabetes mellitus patients.

Univariate Analysis

Table 1. Frequency Distribution of Respondent Characteristics at Ngemplak Community Health Center

characteristics		quantity	Persentase
age			
a.	24-32	3	7.5
b.	34-45	17	42.5
c.	46-55	20	50.0
Gender			
a.	Women	29	72.5
b.	Man	11	27.5

Last education			
a.	Elementary school	2	0.5
b.	Junior High School	16	40.0
c.	Senior High School	17	42.5
d.	Diploma III	5	12.5
Occupation			
a.	State civil service	4	4.0
b.	Self-employed	7	17.5
c.	Factory employees	17	42.5
d.	Farmer	12	30.0

Source: Processed data (2023).

Based on table 1 above, it shows that the characteristics of the respondents, based on age, were mostly in the 46-55 year range with 20 respondents (50.0%). Based on gender, the majority were women, 29 respondents (72.5%). Based on education, most of the respondents were high school graduates, 17 respondents (42.5%). Meanwhile, based on work, the majority of factory employees were 17 respondents (42.5)

Table 2. Frequency Distribution before and after knowledge controlling blood sugar levels

No	Category	Before intervention is given (Pre)		After	intervention is given (Post)	
		f	%		f	%
1	good	31	77.5	38	95.0	
2	enough	9	22.5	2	5.0	
3	less	-		-		
Total		40	100%	40	100%	

Source: Processed data (2023)

Based on table 2, it can be seen that before the education regarding knowledge of controlling blood sugar levels was carried out, 31 (77.5%) respondents had patient knowledge in the Good category, whereas after being given education regarding knowledge of controlling blood sugar levels, the increase in knowledge increased by 38 (95%) respondents have knowledge in the Good category.

Table 3. Average before and after providing knowledge education controlling blood sugar levels

No		Mean	SD
1	Before being given intervention (Pre)	11,87	1,823
2	After being given intervention (Post)	14,22	604

Source: Processed data (2023).

Based on Table 3, the average knowledge of respondents before the education intervention on knowledge of controlling blood sugar levels was 11.87 (SD 1.823), while the average knowledge of respondents after being given education on knowledge of controlling blood sugar levels was 14.22 (SD 604).

Bivariate Analysis

Table 4. The Effect of Providing Education on Knowledge of Controlling Blood Sugar Levels

		Mean Difference	SD	T	p
Before-After Education knowledge controlling blood levels	on of sugar	-2,35	1,875	-9,153	000

Source: Processed data (2023).

Based on table 4, it shows that the results of the paired t-test show that there is an effect of education on knowledge of controlling blood sugar levels with a value of P .000. Based on the T value where the t table with a value of Df = 38 is 2.00563, and the calculated t value is -9.153, which means the calculated t value is > from the t table value, it can be concluded that based on the calculated T value > -9.153 compared to the T table value of 2.0563 and P value <0.05 so there is an increase in understanding regarding knowledge of controlling blood sugar levels. There is an influence of education with booklets on knowledge of controlling blood sugar levels.

Knowledge of Controlling Blood Sugar Levels

The results of the study showed that respondents with a higher level of education had a higher average score for controlling diabetes blood sugar levels. Apart from that, based on statistical tests, it shows a significant difference where knowledge of controlling blood sugar levels was 31 (77.5%) respondents before being given education, whereas after being given education regarding knowledge of controlling blood sugar levels, knowledge increased by 38 (95%) respondents had knowledge. is in the Good category, so it can be concluded that there has been an increase in knowledge regarding controlling blood sugar levels after being given educational treatment using the Booklet. According to (Basuki E, 2005), DM sufferers who have sufficient knowledge about DM will change their behavior to control their disease condition so they can live longer. According to Smith (2002), changes in disease patterns from acute to chronic or someone who has a chronic disease tends to have increased knowledge. Patients try to find as clear information as possible about their illness, both from health workers and from other information media. The results of similar research by (Susilaningsih, 2017) show that health education using the discussion method can further improve knowledge and attitudes and reduce blood glucose levels in type 2 DM patients. Research by Sopiyan (2018) states that there is a difference in increasing knowledge after providing nutrition education using pocket book media. and leaflets (Hidayah & Sopiyan, 2019). Strengthened by Restuning's research, (2015) stated that communication between health workers through diabetes education in the form of lectures using leaflets as media can increase diabetes patient compliance. The more often someone receives counseling, the better their behavior will be. Diabetes sufferers need to receive information about the meaning of DM, especially meal planning. Knowledge about diabetes management is an important component so that diabetes management can run well (Restuning, 2015)

The level of knowledge is very necessary in managing DM diet, but the individual's ability to manage daily life, control and reduce the impact of the disease they suffer is known as Self-management is needed in controlling DM. Self-management allows patients to develop problem-solving skills, increases self-confidence (self-efficacy) and supports the application of knowledge in real life. Having the skills and knowledge to solve problems in DM disease allows patients to make decisions about the best management for themselves. This self-management greatly influences the process and results of disease management. This is supported by research by Setyorini (2017) which states that 15 out of 19 DM patients have more knowledge and good self-management in managing the DM diet, patients prefer to follow the doctor's recommendations, avoid eating sweets, eat more vegetables than rice and avoid stress. to prevent an increase in blood sugar levels (Setiyorini *et al.*, 2017). Fitri Suciana (2019) stated that there are 5 main pillars of treatment for type 2 DM patients, namely education, medical nutrition diet, physical exercise, pharmacological drugs and monitoring blood sugar levels. Education plays a very important role in the management of type 2 DM because providing education to patients can change the patient's behavior in carrying out self-care for diabetes mellitus in controlling the patient's blood sugar (Suciana *et al.*, 2019). This research is in line with research conducted by Tania (2016) on type 2 DM outpatients at Fatmawati Hospital, stating that

respondents who had a good level of knowledge were 12.5 times more compliant with their compared to respondents who had less knowledge. The research results also show that the level of knowledge is a risk factor for diet compliance in type 2 DM patients (Dita Wahyu Hestiana, 2017). Research that is in line with Mareyke Y.L Sepang's (2020) results states that providing structured education using booklet media has a significant influence on the level of patient knowledge about T2DM (Sepang *et al.*, 2020).

Researchers assume that knowledge of blood sugar control in people with type II diabetes mellitus is influenced by the health education provided because with health education, information about the Diabetes Mellitus diet given to diabetes sufferers and their families can increase their knowledge. Providing regular health education with simple material, appropriate methods, adequate material providers and booklet media can increase respondents' knowledge, so that they can increase knowledge in controlling blood sugar and change behavior and lifestyle so as to prevent complications.

CONCLUSION

Based on the results of research by providing booklet education on knowledge in controlling blood sugar levels in DM sufferers, namely: Based on statistical tests, it shows a significant difference where knowledge of controlling blood sugar levels was 31 (77.5%) respondents before being given education, whereas after being given education regarding knowledge of controlling blood sugar levels the increase in knowledge increased by 38 (95%) respondents who had knowledge in Good category, so it can be concluded that there has been an increase in knowledge regarding controlling blood sugar levels after being given educational treatment using the booklet.

The results of the paired t-test showed an effect of education on knowledge of controlling blood sugar levels with a value of $P .000$. Based on the T value where the t table with a value of $Df = 38$ is 2.00563, and the calculated t value is -9.153, which means the calculated t value $>$ the t table value, it can be concluded that there is an influence of education with booklets on knowledge of controlling blood sugar levels.

REFERENCES

- Aminah, S., Amelia, K. R., Rianto, B., & Safitri, V. D. (2022). Pengaruh Edukasi Self Management Diabetes (DSME) Dengan Media Booklet Terhadap Kepatuhan Diet Pasien DM Tipe 2 Di Puskesmas Cimahi Selatan. *Malahayati Nursing Journal*, 5(2), 432–442. <https://doi.org/10.33024/mnj.v5i2.5912>
- Basuki E. (2005). *Penyuluhan Diabetes Mellitus. Dalam Penatalaksanaan Diabetes Mellitus Terpadu*. Dewi, S. purnama. (2022). *Pengaruh media booklet terhadap tingkat kepatuhan diet pasien diabetes melitus tipe-2 di Puskesmas Gamping II*. 61–69. <http://eprints.poltekkesjogja.ac.id/id/eprint/8194>
- Dita Wahyu Hestiana. (2017). Faktor-Faktor Yang Berhubungan Dengan Kepatuhan Dalam Pengelolaan Diet Pada Pasien Rawat Jalan Diabetes Mellitus Tipe 2 Di Kota Semarang Dita. *Journal of Laboratory Medicine*, 2(2), 138–146.
- Hidayah, M., & Sopiandi, S. (2019). Efektifitas Penggunaan Media Edukasi Buku Saku Dan Leaflet Terhadap Pengetahuan Dan Kepatuhan Diet Pasien Rawat Jalan Diabetes Melitus Tipe 2 Di Puskesmas. *Pontianak Nutrition Journal (PNJ)*, 1(2), 66. <https://doi.org/10.30602/pnj.v1i2.290>
- InfoDATin. (2020). *Tetap Produktif, Cegah, dan Atasi Diabetes Melitus*. InfoDATin.
- Kemendes RI. (2018). *riskesdas 2018. Hasil Utama*.
- Kemendes RI. (2019). Buku Pedoman Penyakit Tidak Menular. *Kementerian Kesehatan RI*, 101. http://p2ptm.kemkes.go.id/uploads/VHcrbkVobjRzUDN3UCs4eUJ0dVBndz09/2019/03/Buku_Pedoman_Manajemen_PTM.pdf
- Litbangkes, B. (2018). *Laporan Nasional Riskesdas 2018*. Kementerian Kesehatan Republik Indonesia.
- Muhlisin, A., & Irdawati. (2010). Teori self care dari Orem dan pendekatan dalam praktek keperawatan. *Berita Ilmu Keperawatan*, 2 (2), 97–100. https://publikasiilmiah.ums.ac.id/bitstream/handle/11617/2044/BIK_Vol_2_No_2_9_Abi_Muhlisin.pdf?sequence=1
- Notoatmodjo Soekidjo. (2018). Metodologi Penelitian Kesehatan. In *Rineka Cipta*.
- Pralisaputri K R, Heribertus, S., & Chatarina, M. (2016). Pengembangan Media Booklet Berbasis SETS Pada Materi Pokok Mitigasi Dan Adaptasi Bencana Alam Untuk Kelas X SMA. *Jurnal GeoEco*, 2(2), 147–154. <https://jurnal.uns.ac.id/geoeco/article/view/8930>
- Ratna Dewi Pudiastuti. (2013). *Penyakit-Penyakit Mematikan*. Nuha Medika.
- Restuning, D. (2015). Education in Improving the Effectiveness of Compliance with Setting Diet in

- Type 2 Diabetes Mellitus. *Mutiara Medika*, 15(1), 37–41.
- Sepang, M. Y. L., Patandung, V. P., & Rembet, I. Y. (2020). Pengaruh Edukasi Terstruktur Dengan Media Booklet Terhadap Tingkat Pengetahuan Pasien Diabetes Melitus Tipe 2 Mellitus. *Jurnal Ilmiah Perawat Manado*, 8(1), 70–78. <https://ejurnal.poltekkes-manado.ac.id/index.php/juiperdo/article/view/1155/831>
- Setiyorini, S., Patonah, S., & Murniati, N. A. N. (2017). Pengembangan Media Pembelajaran Moodle. *Jurnal Penelitian Pembelajaran Fisika*, 7(2), 156–160. <https://doi.org/10.26877/jp2f.v7i2.1311>
- Suciana, F., Daryani, Marwanti, & Arifianto, D. (2019). Penatalaksanaan 5 Pilar Pengendalian Dm Terhadap Kualitas Hidup Pasien Dm Tipe 2. *Jurnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal*, 9(4), 311–318.
- Susilaningsih, T. (2017). Pengaruh pendidikan kesehatan dengan media video terhadap tingkat pengetahuan diet pada keluarga penderita di puskesmas. *Ilmu Kesehatan*, 1–12. http://digilib.unisayogya.ac.id/2616/1/NASKAH_PUBLIKAS.pdf.
- Umat, D., St, P., & Padua, A. (2022). Edukasi Diabetes Melitus Dan Pemeriksaan Kadar Glukosa. *Jurnal Pengabdian Kepada Masyarakat MAPALUS*, 1(1), 18–25.
- Windani, C., Sari, M., Yamin, A., & Sari, S. P. (n.d.). Edukasi Berbasis Masyarakat untuk Deteksi Dini Diabetes Melitus Tipe 2 Pendahuluan Berdasarkan International Diabetes Federation (IDF), Indonesia menempati urutan yang ke-7 untuk jumlah kasus penderita Diabetes Melitus (DM) dari usia 20-79 tahun terba. 1(1), 29–38.