



Education-Based Family Empowerment in Diabetic Foot Ulcer Early Detection Using Ipswich Touch Test of Knowledge and Skills

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Abstract

Identifying patients with diabetes mellitus who experience an impaired sensation that ultimately causes Diabetic Foot Ulcer (DFU) is a necessary action. One of the efforts to prevent diabetic foot is to identify, which can be done by family members of the patient at home, but this has not been done. The aim is to determine the effect of education-based family empowerment in the early detection of Diabetic Foot Ulcers using the Ipswich Touch Test on knowledge and skills at the Mataram City Health Center. The design used a pre-experimental design with a pre-post one-group test. The sample was 45 respondents given family empowerment interventions through coaching in educational programs four times a week for two weeks. The results of family knowledge before being given the intervention were mostly lacking, as many as 36 people (86.7%), while after being given the intervention, all respondents got good knowledge, as many as 45 people (100% and $p\text{-value} = 0.000 < = 0.005$ coaching with $p = 0.000$ and skills All of the skill families before being given the intervention had poor skills as many as 45 people (100%) and after being given the intervention all respondents got good skills as many as 45 people (100%) $p = 0.000 < = 0.005$. So it can be concluded that education-based family empowerment in early detection of diabetic foot ulcers using the Ipswich touch test on knowledge and skills.

Keywords: Empowerment; Family; Education

INTRODUCTION

Diabetes mellitus (DM) is a complex chronic disease that requires ongoing treatment with multifactorial risk reduction strategies beyond glycemic control (American Diabetes Association, 2017). Handling diabetes mellitus is very complex. If not handled properly, it can cause complications. One of the complications of diabetes is neuropathy or often referred to as impaired sensation. Identifying patients with diabetes mellitus who experience impaired sensation can prevent the occurrence of Diabetic Foot

Ulcer (DFU), so this action is essential (Boulton et al., 2008).

The condition of the COVID-19 pandemic with the New Normal. All restrictions require people with Diabetes Mellitus to maintain their health, assisted by their families (Dewantha, I, 2020). However, in reality, in health services, the required neuropathy examination often takes much time so that it is rarely done or even abandoned altogether, which has an impact on the occurrence of neuropathy or sensation disturbances which are often not realized by the

patient so that it can pose a risk of DFU or diabetic foot ulcers (Calle-Pascual, et al., 2002).

Neuropathy data in Indonesia is 43% of the 16,800 respondents who are proven to be at risk for peripheral neuropathy (PERKENI, 2015). Neuropathy has a significant role in diabetic ulcers. When neuropathy is not present, ulcers are rare. This is in line with the research of Agbaor et al. found that more than 80% of diabetic ulcers were associated with neuropathy. Diabetic foot ulcers or Diabetic Foot ulcers (DFU) are one of the most common factors causing extremity amputations, 15-45 times more often in people with diabetes than without diabetes (Christia et al., 2015).

Data on sensation disturbances experienced by DM patients in the city of Mataram, precisely at Tanjung Karang Health Center, Cakra Health Center, and Health Center from the results of the study, 60 respondents 37 people (61%) experienced sensation disorders (Sentana AD, Fatoni A, Sumartini NP, 2020). One of the efforts to prevent DFU is to identify what can be done by the patient's family at home (Sharma et al., 2014). The role of the family is also emphasized (Friedman, 2013).

The family can be involved as an educational target. Notoatmodjo (2012) also explained that changes in patient behavior toward treatment programs could not be separated from family support. However, research on family empowerment related to the early detection of DFU using the Ipswich Touch Test has yet to be studied. Previous research on early detection of DFU using the Ipswich Touch Test is still limited in proving that this test is accurate, simple, and can be done at home in the detection of DFU (Sharma et al., 2014).

For this reason, it is necessary to have this empowerment so that families gain sufficient knowledge, skills, and strength to influence their lives and those of other people they care about (Arifah et

al., 2017). The results of research by Cai & Hu (2016) showed that family empowerment could significantly change knowledge of diabetes, diabetes self-efficacy, self-care activities, quality of life, and quality of health-related life.

Given the importance of family involvement in supporting health problems in foot care so that it can be part of efforts to prevent early exposure, families as a risk group regarding DM and its management, especially efforts to detect diabetic foot ulcers. Diabetic Foot Ulcer early detection using the Ipswich Touch Test on knowledge and skills at the Mataram City Health Center.

METHOD

This study was approved by Mataram Health polytechnic Research Ethics Commission number: LB.01.03/6/2681/2022 and implemented in 2022.

The research design used in this research is pre-experimental. Respondents were selected from family members who had been diagnosed with diabetes Mellitus when they were treated at the Tanjung Karang Health Center, Dasan Agung Health Center, and Karang Taliwang Health Center, using a purposive sampling technique, and there were 45 respondents. The intervention given to families was family empowerment carried out in their respective homes by providing videos and Footnotes (Bukesku) for 2 (two) weeks, with details: 1) In the first week, researchers empowered families through education with lectures, demonstrations, and videos of family skills. In carrying out early detection of DFU using the Ipswich Touch Test for 4 (four) meetings and recording the examination results in the foot health book (the book distributed). 2) In the second week, the respondent identified independently by watching the video of conducting early detection of DFU using the Ipswich Touch Test that had been given and recording the results of the examination in the foot health book

(which was distributed) and at the end of the second week, the researcher conducted a post-test using the instrument—the same thing at the time of the pre-test. The data measured is knowledge using questionnaires and skills in the form of a checklist for early detection of Diabetic Foot Ulcers using the Ipswich Touch Test. This instrument has been tested for validity and reliability before being used. The validity test uses the Product Moment test, and the reliability test uses Cronbach's Alpha test. The data from the research results were analyzed in two ways. First, univariate

analysis was used to describe each variable measured as a frequency distribution. Second, perform a bivariate analysis using the Wilcoxon Sign Rank Test.

RESULT AND DISCUSSION

To determine the effect of education-based family empowerment in the early detection of Diabetic Foot Ulcers using the Ipswich Touch Test on knowledge and skills at the Mataram City Health Center, both before and after the intervention. There will be presented the data:

Table 1 Distribution of respondent characteristics in Mataram City in 2022

No	Category	n	%
	Age		
1	Late Adolescence (17-25 years)	8	17,8
2	Early Adults (26-35 years)	14	31,1
3	Late Adults (36-45 years)	7	15,6
4	Early Elderly (46-55 years old)	8	17,8
5	Late Elderly (56-65 years)	8	17,8
	Total	45	100
	Gender		
1	Women	32	71,1
2	Man	13	28,9
3	Total	45	100
	Level of education		
1	Basic education	15	33,3
2	Middle Education	18	40,0
3	Higher education	12	26,7
	Total	45	100
	Employment		
1	Does not work	35	77,8
2	Working	10	22,2
	Total	45	100
	Information		
1	Never get information	45	100,0
2	Ever get information	0	0,0
	Total	45	100

Based on the table above, the highest number of ages is early adulthood with a total of 14 people (31.1%), the highest number of gender is women, as many as 32 people (71.1%), the highest number of respondents with education is secondary education as many as 18 people (40.0%), the majority of respondents based on occupation were not working, as many as 35 people (77.8%) and all of the respondents had never received health information about how to

check for early detection of wounds on the feet using the foot touch test (Ipswich Touch Test) as many as 45 people (100%).

Table 2 Distribution of Knowledge Before and After Intervention and the results of the Wilcoxon Sign rank Test statistic in Mataram City in 2022

No	Knowledge Category	Before		After	
		n	%	n	%
1	Good	0	0,0	45	100,0
2	Enough	6	13,3	0	0,0
3	Not enough	39	86,7	0	0,0
	Total	45	100	45	100

p = 0,000

Based on the table above, the knowledge before being given the intervention was mostly lacking in as many as 36 people (86.7%). In comparison, after being given the intervention, all respondents got good knowledge, as many as 45 people (100% and from the

results of the Wilcoxon Sign Rank Test $p = 0.000 < =0.005$, there is an effect of education-based family empowerment in early detection of diabetic foot ulcers using the Ipswich touch test on knowledge.

Table 3 Distribution of Skills Before and After Intervention and the results of the Wilcoxon Sign rank Test statistic at the Mataram City Health Center in 2022

No	Skill Category	Before		After	
		n	%	n	%
1	Good	0	0,0	45	100,0
2	Enough	0	0,0	0	0,0
3	Not enough	45	100	0	0,0
	Total	45	100	45	100

p = 0,000

Based on the table above, it can be seen that the skills before being given the intervention all had fewer skills, as many as 45 people (100%). However, after being given the intervention, all respondents got good skills, as many as 45 people (100% and from the results of the Wilcoxon Sign Rank Test, the p-value was obtained. $= 0.000 < = 0.005$ there is an effect of education-based family empowerment in the early detection of diabetic foot ulcers using the Ipswich touch test on skills.

Rank Test test $p = 0.000 < =0.005$ means that there is an effect of education-based family empowerment in early detection of diabetic foot ulcers using the Ipswich touch test on knowledge.

DISCUSSION

The results of this study indicate that the knowledge before being given the intervention could have been improved by 36 people (86.7%). In contrast, after being given the intervention, all respondents got good knowledge as many as 45 people (100%), and from the results of the Wilcoxon Sign

This change in knowledge occurred because the family received an empowerment intervention. Arifah et al. (2017) explained that empowerment emphasizes that people acquire sufficient knowledge to influence their lives and those of others they care about. In this case, as Friedman (2013) also emphasized, there are five family responsibilities, including knowing the medical history of each member, making decisions about appropriate behavior, and caring for sick family members. , can include the family as an educational goal.

This opinion is in line with this study. Families are involved and empowered in caring for family members to detect diabetic foot ulcers early. The

results of research by Cai & Hu (2016) showed that family empowerment could significantly change diabetes knowledge, diabetes self-efficacy, self-care activities, quality of life, and health-related quality of life. Further explained by Wichit et al. (2017), family empowerment also affects significant changes over time reported in diet, exercise self-management, self-efficacy, improved diabetes self-management, and adjustment to achieve glycemic control.

Increased knowledge families gain is also due to education-based family empowerment using videos containing early detection of diabetic foot ulcers using the Ipswich touch test. According to Levie & Lentz (in Sanaky, 2013) explaining that video has, namely: attention function and visual media is the core, namely attracting and directing attention to concentrate on the content of the lesson related to the visual meaning displayed or accompanying the text of the subject matter, affective function, visual media can be seen from the level of enjoyment of learners when learning to read illustrated texts, cognitive function, visual media expresses that visual symbols facilitate the achievement of goals to understand and remember information or messages contained in images, compensatory functions, visual media help context for understanding texts students who are weak in reading or organizing information in texts and remembering.

This is also emphasized by Sudiharto (2007) in (Windani, Sari, & Haroen, and Hartiah, 2016), providing informative and exciting educational materials as an influential supporters of providing education. Interesting educational materials will increase understanding and stimulate patient enthusiasm in following the presentation of the material. The results of the research by Massi et al. (2018) stated that the video education method was very effective in increasing the knowledge of Type 2 DM patients, and the use of video was also from the research results of Myer, Dale (2000), explaining that

family involvement affected video-based training on verbal behavior. Previous studies reported that the use of media during health education sessions was effective in increasing knowledge and behavior both in the short term (Sae-Sia et al., 2013) and long term (6 months) (Vatankhah et al., 2009) (Windani et al., 2016).

Skills before being given the intervention, all had fewer skills, as many as 45 people (100%). However, after being given the intervention, all respondents got good skills as many as 45 people (100% and from the Wilcoxon Sign Rank Test test results obtained p value = 0.000 < = 0.005 there is an effect Education-based family empowerment in early detection of diabetic foot ulcers using the Ipswich touch test on skills.

Arifah et al. (2017) explain that empowerment to families is emphasized so that families acquire skills, then sufficient power to influence their lives and those of other people who are of concern to them. It is also explained that changes in patient behavior toward treatment programs cannot be separated from family support (Notoatmodjo, 2012). Besides that, empowering families to improve skills through coaching in educational programs in this study, which was also followed up with home visits four times a week for two weeks, had an impact on the ability to carry out early detection checks for diabetic foot ulcers using the Ipswich touch test by respondents. This aligns with the research results by Bodenheimer et al. (2007) in Windani et al. (2016). Providing motivational interventions to take action through regular home visits can facilitate respondents to increase knowledge, responsibility, skills, and motivation on an ongoing basis. To improve foot care behavior. Previous research aimed at changing behavior and receiving follow-up (in the form of telephone, email, and repeated home visits) in which respondents also received a response to change, resulting in the expected behavior change compared to

only aiming for behavior change without any follow-up or response.

CONCLUSIONS

Education-based family empowerment in the early detection of diabetic foot ulcers using the Ipswich touch test can increase knowledge and skills in the early detection of foot ulcers. However, the weakness of this research is the non-random sampling technique.

REFERENCES

- American Diabetes Association. (2017). Standards of Medical Care in Diabetes. *Diabetes Care*, 40(January), s33–s43. <https://doi.org/10.2337/dc14-S014>
- Arifah, U., Anwar, S., Aziz, A., & Pengembangan Masyarakat Islam Fakultas Dakwah dan Komunikasi UIN Sunan Gunung Djati Bandung, J. (2017). Pemberdayaan Keluarga sebagai Model Pemberdayaan Masyarakat. *Tamkin: Jurnal Pengembangan Masyarakat Islam*, 2, 96–118. <http://jurnal.fdk.uinsgd.ac.id/index.php/tamkin/article/view/757>
- Boulton, A. J. M., Armstrong, D. G., Albert, S. F., Frykberg, R. G., Hellman, R., Sue Kirkman, M., Lavery, L. A., LeMaster, J. W., Mills, J. L., Mueller, M. J., Sheehan, P., & Wukich, D. K. (2008). Comprehensive foot examination and risk assessment: A report of the task force of the foot care interest group of the American diabetes association, with endorsement by the American association of clinical endocrinologists. *Physical Therapy*, 88(11), 1437–1443. <https://doi.org/10.2337/dc08-9021>
- Cai, C., & Hu, J. (2016). Effectiveness of a Family-based Diabetes Self-management Educational Intervention for Chinese Adults With Type 2 Diabetes in Wuhan, China. *Diabetes Educator*, 42(6), 697–711. <https://doi.org/10.1177/0145721716674325>
- Calle-Pascual, A. L., Durán, A., Benedí, A., Calvo, M. I., Charro, A., Diaz, J. A., Calle, J. R., Gil, E., Maraes, J. P., & Cabezas-Cerrato, J. (2002). A preventative foot care program for people with diabetes with different stages of neuropathy. *Diabetes Research and Clinical Practice*, 57(2), 111–117. [https://doi.org/10.1016/S0168-8227\(02\)00024-4](https://doi.org/10.1016/S0168-8227(02)00024-4)
- Dewantha, I, M. (2020). Pencegahan Komplikasi Dm Pada Era Pandemi Covid 19. <https://rsud.kulonprogo.kab.go.id/detil/507/pencegahan-komplikasi-dm-pada-era-pandemi-covid-19>
- Ferguson, N. F., & Estis, J. M. (2018). Training students to evaluate preterm infant feeding safety using a video-recorded patient simulation approach. *American Journal of Speech-Language Pathology*, 27(2), 566–573. https://doi.org/10.1044/2017_AJSLP-16-0107
- Friedman, M. (2013). *Buku ajar keperawatan keluarga: Riset, Teori, praktek*. Gosyen Publishing.
- Madanat, A., Sheshah, E., Badawy, E. B., Abbas, A., & Anas, A. B. (2015). Response to the comment by Vas PR et al.: "p.R. Vas, S. Sharma, G. Rayman, Utilizing the Ipswich Touch Test to simplify screening methods for identifying the risk of foot ulceration among people with diabetes: Comment on the Saudi experience. *Prim. Care Diabetes (Primary Care Diabetes)*, 9(5), 401–402. <https://doi.org/10.1016/j.pcd.2015.04.003>
- Massi, G., Kallo, V., Studi, P., Keperawatan, I., Kedokteran, F., & Ratulangi, U. S. (2018). Efektifitas Pemberian Edukasi Dengan Metode Video Dan Focus Group Discussion (Fgd) Terhadap Tingkat Pengetahuan Pasien Dm Tipe 2 Di Klinikdiabetes Kimia Farma Husada Manado. *Jurnal Keperawatan*, 6(1), 1–6.
- Myer, D., R. (2000). *Knowledge And Family Involvement In Special Education: The Effects Of Video-Based Training On Verbal Behavior, Perceptions Of Competence, And Satisfaction* [University of Oregon]. <https://media.proquest.com/media/pq/classic/doc/727867381/fmt/ai/rep/SPDF?cit%3Aauth=Mye>

rs%2C+Dale+R.&cit%3Atitle=Knowledge+and+family+involvement+in+special+education%3A+The+effects+of+...&cit%3Apub=ProQuest+Dissertations+and+Theses&cit%3Avol=&cit%3Aiss=

Notoatmodjo, S. (2012). *Promosi Kesehatan dan Ilmu Perilaku*. Rhinika Cipta.

PERKENI. (2015). *Pengelolaan dan Pencegahan Diabetes Melitus Tipe 2 di Indonesia*,.

Sanaky, H. A. H. (2013). *Media Pembelajaran Interaktif-Inovatif*. Yogyakarta: Kaukaba.

Sentana AD, Fatoni A, Sumartini NP. (2020). Using The Booklets “Raka” (Rawat Kaki) In Preventing Diabetic Neuropati In Mataram City. *Jurnal Kesehatan Prima, Volume 14(2)*, 106–111. <https://doi.org/10.32.807/jkp.v14i2.539>

Sharma, S., Kerry, C., Atkins, H., & Rayman, G. (2014). The Ipswich Touch Test: A simple and

novel method to screen patients with diabetes at home for increased risk of foot ulceration. *Diabetic Medicine*, 31(9), 1100–1103. <https://doi.org/10.1111/dme.12450>

Shin, Y. J., Miller-Day, M., Hecht, M. L., & Krieger, J. L. (2018). Entertainment–Education Videos as a Persuasive Tool in the Substance Use Prevention Intervention "keepin' it REAL." *Health Communication*, 33(7), 896–906. <https://doi.org/10.1080/10410236.2017.1321163>

Wichit, N., Mnatzaganian, G., Courtney, M., Schulz, P., & Johnson, M. (2017). Randomized controlled trial of a family-oriented self-management program to improve self-efficacy, glycemic control, and quality of life among Thai individuals with Type 2 diabetes. *Diabetes Research and Clinical Practice*, pp. 123, 37–48. <https://doi.org/10.1016/j.diabres.2016.11.013>