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Simulation of Interprofessional Collaboration on Self-Awareness of Diabetes Mellitus Patients

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Abstract

Diabetes mellitus is a non-communicable disease that is included in the chronic disease category and is expected to increase, so a method is needed to carry out the control recommended by the Ministry of Health in the form of intelligent management of diabetes mellitus. The management given to people with diabetes is developed based on the theory of the Health Promotion Model and the form of Diabetes Self-Management Education (DSME) intervention. The aim was to analyze the simulation of interprofessional collaboration on self-awareness of diabetes mellitus patients. Quasi Experiment Pre-Post Test with Control Group Design for 4 weeks consisting of 8 sessions and each session ± 30 minutes. The samples were taken using simple random sampling technique, namely type 2 diabetes mellitus as many as 58 respondents in each intervention and control group. The instrument used a diabetes mellitus self-awareness questionnaire with 51 statement items that had been tested for validity and reliability. The data analysis used a paired t-test. There was a significant difference in the self-awareness of people with type 2 diabetes before and after being given the Interprofessional Collaboration Simulation (IPC-S) which had a significant p-value of 0.001 <0.05. In the control group, there was no significant difference in the self-awareness of people with type 2 diabetes before and after being given Interprofessional Collaborative Simulation (IPC-S) with a significant p-value of 0.569 > 0.05. There was a difference in self-awareness in the intervention group because the method provided was complete which was adapted to the needs of the patient so far, to still be able to manage the disease so that blood sugar levels can be controlled. This activity directly has also made the respondents in the intervention group have more self-awareness, higher than the control group.

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INTRODUCTION

Diabetes has increased from 1.7 to 2.2 million caused by risk factors such as smoking, unhealthy diet, lack of physical activity, and alcohol use (Fradianto et al., 2023). The International Diabetes Federation (IDF) has estimated data that in 2015 there were 415 million people diagnosed with diabetes mellitus in the world, and it is estimated that by 2040 there will be an increase to 642 million people (Abu Al-Halaweh et al., 2017). Indonesia is a low and middle-income country and the prevalence of diabetes has almost doubled since 1980 (Radhika et al., 2020). Indonesia also contributed a sizable prevalence related to the number of people with diabetes from 2007, 2013, and 2018 which has increased, which can be seen from Basic Health Research data that as many as 5.7% in 2007, 6.9% in 2013 and became 8, 5% in 2018 (Riskesdas, 2018). Mojokerto Regency is one of the districts that contribute the most prevalence of diabetes in East Java. This disease is in second place after hypertension with 34,958 cases (Kemenkes, 2020).

Risk factors for diabetes mellitus were also found, including gender, age > 45 years, overweight and obesity, body mass index (BMI) > 30kg/m2, high blood pressure, sleep patterns, and body mass index (Hein et al., 2017; Joseph et al., 2017; Spurr et al., 2017). Diabetes mellitus (DM) will become a serious problem if the patient has an unhealthy lifestyle (Vural et al., 2018). Recent findings in a study based on social-cognitive theory found that self-efficacy in women with diabetes mellitus has been effective in increasing physical activity (Rustam & Putri, 2021). Research was conducted on the factors that influence the self-management of type 2 diabetes in adults in Malang City, East Java with the results being able to increase self-efficacy and self-awareness of people with diabetes to achieve good self-management behavior, such as having a healthy diet, exercising regularly, actively monitoring blood sugar levels, taking medication regularly and doing foot care (Dwi et al., 2017). Diabetes mellitus can be prevented and controlled by controlling risk factors (Andriyanto & Hidayati, 2018).

Management of risk factors for diabetes mellitus can involve the family because the family has a role in caring for its family members. Diet and activity arrangements can be made by the family as a form of prevention against risk factors and care for family members diagnosed with type 2 diabetes mellitus to keep it from getting to the next level of severity (Andriyanto et al., 2022). Service providers especially in Posbindu activities need to educate people with diabetes about the need for proper preventive care. Likewise, collaboration between primary care and service providers can help identify those at risk early and better manage the disease by increasing the self-awareness of people with diabetes by exploring their self-efficacy (Nugraheni et al., 2018). Health promotion activities in many studies have been stated as a determinant of a person's self-awareness, therefore health promotion will be an important factor in promoting self-awareness in people with diabetes (Lari et al., 2017; Wang et al., 2016).

Health promotion will have an impact if behavior change theories and techniques are not appropriate (Andriyanto & Hidayati, 2018). In efforts to reduce this impact, an approach is needed to support people with diabetes to increase awareness by providing health promotion interventions based on inter-professional collaboration involving all components of the existing health workforce (Andriyanto & Hidayati, 2021). Health workers are expected to be able to provide the necessary support for people with diabetes so that they are always able to maintain optimal health status and independence. Health workers who do not understand how to care for people with diabetes will feel the burden of caring for them. This increasing burden of care will reduce the ability of health workers to provide care for people with diabetes (Tan et al., 2019). Training for health workers is needed to support fulfilling the basic needs of people with diabetes. In addition, health workers must also be able to collaborate in increasing empowerment by motivating people with diabetes to routinely carry out their health checks at the nearest service (Luthfa & Ardian, 2019). The aim of analyzing simulation interprofessional collaboration on self-awareness of diabetes mellitus patients.

METHODS

The research designs used a quasi-experiment with a control group design for 6 weeks. The researchers collected pre-test data on 4-5 April 2023 in the intervention and control group. In the intervention group, respondents were divided into 6 groups, each group contained 7-9 respondents to be given education, nutritional management, physical activity, and stress management. The intervention was conducted for 4 weeks consisting of 8 sessions and each session was ± 30 minutes. The speakers

consisted of specialist doctors in endocrine medicine, specialist nurses, executive nurses, nutritionists, and physiotherapists. After the intervention is given, a 2-week facilitation phase is required for people with diabetes to study independently with follow-up 4 times, and 1 week of internalization phase. After that, on 29-30 May 2023 a post-test group of intervention and control. On 1-4 June 2023 the same intervention was conducted in the control group. The intervention activities are presented in Table 1.

The sample in this research was calculated by the formula based on calculating the hypothesis test sample of different proportions. The estimation was performed on 5% significance degree and 80% test strength. Then it is known: ZI-α = 1.96, ZI-β = 0.84, P1 = 0.65, P2 = 0.94, P = (0.65 + 0.94) / 2 = 0.79. The minimum sample size was 29 x 2 (effect design) = 58 respondents for each intervention and control group.

Table 1. Intervention schedule IPC-S

Activities	Material activities	Method
Session 1	Education diabetes	Diabetes education using a talk show method by a specialist in internal medicine followed by educational games with specialist nurses regarding what diabetes is, risk factors for diabetes, signs and symptoms of diabetes, and disease management. Presented in a game of who is the smartest in each group to select respondents to become group leaders in the next session.
Session 2	Education hyper & hypoglycemia	Nurse with group process method: Self-Help Group This activity aims to find the most effective solution to the problem. The selected group leader will tell you how to manage hypoglycemia and hyperglycemia conditions while at home.
Session 3	Dietary education	The next lesson was delivered by a nutritionist about the 3J diet (Type, Amount, Schedule) for diabetes patients using booklet media.
Session 4	Educate recommended, restricted, and avoided foods	This learning is provided by nurses and nutritionists using a game method to find out which foods are recommended, limited, and avoided by DM patients. The game uses a corkboard and food drawing paper. Participants group these foods according to their groups in boxes that already have food marks recommended, limited, and avoided
Session 5	Calculating calorie needs	Participants are taught how to calculate daily calorie needs by using the formula for calculating daily calorie needs for DM patients. The results of the calculations are used as the participant's threshold value for meeting calorie needs in a day.
Session 6	Prepare a meal menu a day.	Next with the nurse and nutritionist. Participants prepare food needs or prepare a daily meal menu according to the calculation of calorie needs. The method used is a direct demonstration using my food plate and food models according to their calorie weight.
Session 7	Foot exercise and marbles therapy	Nurses and physiotherapists teach foot exercises by adding marbles to the exercise movements.
Session 8	Progressive muscle relaxation	Specialist nurses and executive nurses teach progressive muscle relaxation accompanied by classical music.

Sampling technique by purposive a sampling is sampling technique by the criteria and objectives of the study. The sample in this research had inclusion criteria, among others; 1) client with a medical diagnosis of type 2 diabetes mellitus obtained from the registration book of Mojosari Community Health Center; 2) adult age (35 - 59 years); 3) able to read-write. The sample exclusion criteria in this study were clients with diabetic foot complications and clients who had bed rest. The instruments in this study were questionnaires that had been developed by (Soltanian et al., 2017) with a total of 51 questions. The choice of answers for each question in the questionnaire is yes/no/I don't know. The correct answer is given a score of 1, and the wrong answer or I don't know given a zero score. Based on these values, the minimum and maximum points associated with the questionnaire are 0 and 51. Scores of less than 13.5 are considered poor awareness, a score of 13.5 - 38.5 is said to be moderate awareness, and > 38.5 is considered good awareness. The statistical test for all the above analyses was analyzed with a significance level of 95% (alpha 0.05). The parametric statistical test is used to test the difference between two paired dependent means using paired t-test and pooled t-test to test the difference between two independent means. This research has passed the ethical test from Bina Sehat University PPNI Mojokerto with number IV.a/3.P/LPPM.KL/XII/2022.

RESULTS

Based on Table 2, most respondents' characteristics are age 26-35 years, male gender, junior and senior high school education, private employment, multiple referral types, old diagnosed 3.84 years.

Table 2. The characteristics of respondents

Characteristics of respondents	Intervention (n=47)		Control (n=52)	
	f	%	f	%
Gender				
Man	14	29.8	16	30.8
Woman	33	70.2	36	69.2
Education				
No school	2	4.3	4	7.7
Not completed in primary school	5	10.6	5	9.6
Graduated from elementary school	11	23.4	15	28.8
Graduated from junior high school	17	36.2	16	30.8
Graduated from high school	11	23.4	9	17.3
College	1	2.1	2	3.8
Sources of information about DM				
Health workers	9	19.1	11	21.2
Family/friends	13	27.7	14	26.9
Media (TV/newspapers, internet, posters)	11	23.4	12	23.1
Not getting information from anyone	14	29.8	15	28.8
Income				
< Rp 3.565.660	42	89.4	43	82.7
≥ Rp 3.565.660	5	10.6	9	17.3
Age				
Mena ± SD	45.70 ± 6.928		45.85 ± 7.207	

Source: *Primary Data*

The characteristics of respondents in the intervention group were mostly female 70.2% and in the control group 69.2%. Junior high school education in the intervention group was 36.2% and control 30.8%. Never received information about DM in the intervention group 29.8% and control 28.8%.

Table 3. Differences in Self-Awareness People with Type 2 diabetes before and after being given IPC-S to the intervention and control groups

Group		Mean	SD	*p-value*
Intervention	Before	21.96	7.581	0.001*
	After	39.11	6.767	
Control	Before	21.37	6.826	0.569
	After	21.35	6.770	

Source: *Primary Data*

Based on Table 3, the difference in self-awareness of the intervention group before the average was 21.96 to 39.11 after being given IPC-S. Meanwhile, the control group average was 21.37 to 21.35, meaning no significant change existed.

Table 4. The Influence of simulation interprofessional collaboration on self-awareness of diabetes mellitus patients

Group	Mean	Mean difference	SD	*p-value*
Intervention	39.11	17.760	6.767	0.001*
Control	21.35		6.770	

**p significant ≤0,05*

Based on Table 4, a p-value of 0.001 was obtained by the decision-making process that there was a significant influence of interprofessional collaboration simulation on self-awareness of diabetes mellitus patients.

DISCUSSION

The results of this study have shown the effect of simulation interprofessional collaboration on the self-awareness of diabetes mellitus patients. The results showed that people with diabetes are mostly female and have higher self-awareness than men. So it is very necessary and needed efforts promote and preventive more emphasis on the needs of people with diabetes by looking at their respective educational levels (Didarloo et al., 2016). Promotion and preventive efforts can be done in health services that are an integrated post (Posbindu) that has been running to deal with the problem of non-communicable diseases, one of which is diabetes (Reynolds et al., 2017). Healthcare providers may undertake activities to promote promotive and preventive efforts targeting people with type 2 diabetes and men. Promotional efforts can be made through increased access to health information by taking into account the cultural background of respondents and the characteristics of respondents (Andriyanto et al., 2021). Dissemination of good health information is one of the factors that can increase the self-awareness of people with type 2 diabetes, if the information conveyed has been adjusted to the needs of people with diabetes is focusing on pillar management of diabetes mellitus that is in line with the Ministry of Health program in cunning activities (Kemenkes, 2018).

Other findings in this study are that the role of family, friends, and health personnel has been instrumental in the delivery of health information. Adult diabetes feels at ease with the Posbindu held every month, but this is not accompanied by the availability of public health nurses to provide health education to people with type 2 diabetes. So the a need for psychological support for diabetics (Adam et al., 2018). Health personnel play a role in providing health information more reliable and trained. Health professionals, especially community specialist nurses, have the role of educator, facilitator, and nursing aide to assist sick or healthy individuals to engage in activities that contribute to health or recovery so that clients can perform activities without assistance/because the client already has the strengths, wants and knowledge of education (Arveklev et al., 2018). Interventions given to diabetics must follow their needs, to prevent complications so as not to cause the severity of the disease. In this case, appropriate interventions with government programs in the pillars of DM management and nursing orders that look at the needs of people with diabetes are education, nutrition management, physical activity,

and stress management (Stanhope & Lancaster, 2016; William T. Cefalu, 2017).

The provision of nutritional management should be comprehensive about what foods are recommended, limited, and avoided by people with diabetes, and the calculation of body caloric needs also needs to be taught to every diabetes to control the food consumed (Al-Khalifa et al., 2009). Foot gymnastics can also be taught by nurses to people with diabetes in promotive and preventive activities that can be included in Posbindu activities for people with diabetes also know that foot exercises are useful to prevent injuries (Andriyanto et al., 2020). Stress management also needs to be given especially by specialist nurses to people with progressive muscle relaxation that is useful for lowering stress levels and blood sugar levels (Mustika et al., 2021). One thing that service providers and governments should prepare for the self-awareness of people with type 2 diabetes is a good understanding of the characteristics of people with diabetes (Fradianto et al., 2023). The characteristics of sex became prominent considering the number of people with diabetes in this study dominated by women, it is necessary an attempt to make men with diabetes able to be enthusiastic also in the prevention and control of diabetes mellitus (Windartik et al., 2019).

Diabetics age with late adults can also be used for regular education through a support group. Self-awareness of people with diabetes increases with education, nutrition management, physical activity, and stress management that specialist nurses can provide in the health care setting, and can be included in the Posbindu program every month. Therefore, health services should provide more opportunities for health workers, especially nurses to attend training and higher education (Andriyanto et al., 2019). The research limits self-awareness as a very important thing that is owned by someone, especially in this case people with type 2 diabetes. Efforts to increase self-awareness of people with diabetes do IPC-S interventions. This research still has limitations, namely in health education activities, that researchers do not conduct personal evaluations when education takes place to find out whether the respondent is correct or not. In nutrition management activities, there is not yet a meal schedule day a week to be noted for people with diabetes related to what food they consume, so researchers need to evaluate whether the food consumed by people with diabetes is correct or not, as well as progressive muscle relaxation activities that can be done by a mentoring nurse specialist. Another limitation in this study was the occurrence of dropouts in the intervention group for various reasons, including; waiting for one of the sick family members, accompanying the husband to hospitalization, traveling, taking care of the house because his children had not returned home to the Koran, had not returned home, and for reasons that were not clear not to participate in IPC-S intervention activities. However, this does not affect the minimum sample size of researchers.

CONCLUSION

There is a difference in self-awareness in the intervention group because the method provided is complete which is adapted to the needs of the patient so far, to still be able to manage the disease so that blood sugar levels can be controlled, and this activity directly has also made the respondents in the intervention group have more self-awareness. Higher than the control group.

SUGGESTION

The results of this study are used as a reference for modification of health promotion programs, especially in community nursing. EMAS interventions are one of the interventions that need to be considered in increasing the self-awareness of type 2 diabetics. These findings provide the basis for providing interventions for type 2 diabetics that are tailored to their needs and are in line with government programs using a variety of methods and media.

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CONFLICTS OF INTEREST

The authors declare there is no conflict of interest during the process of the research until publication.

AUTHOR CONTRIBUTIONS

Both authors; Muhammad Sajidin (MS) and Arief Andriyanto (AA) are fully contributed in the research start from research proposals, research

instruments, data analysis, literature review/analysis; references.

REFERENCES

Abu Al-Halaweh, A., Davidovitch, N., Almdal, T. P., Cowan, A., Khatib, S., Nasser-Eddin, L., & Baradia, Z. (2017). Prevalence of type 2 diabetes mellitus complications among Palestinians with T2DM. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, *11*(2017), S783–S787. https://doi.org/10.1016/j.dsx.2017.05.017

Adam, L., O'Connor, C., & Garcia, A. C. (2018). Evaluating the Impact of Diabetes Self-Management Education Methods on Knowledge, Attitudes, and Behaviours of Adult Patients With Type 2 Diabetes Mellitus. *Canadian Journal of Diabetes*, *42*(5), 470-477.e2. https://doi.org/10.1016/j.jcjd.2017.11.003

Al-Khalifa, A., Mathew, T. C., Al-Zaid, N. S., Mathew, E., & Dashti, H. M. (2009). Therapeutic role of low-carbohydrate ketogenic diet in diabetes. *Nutrition*, *25*(11–12), 1177–1185. https://doi.org/10.1016/j.nut.2009.04.004

Andriyanto, A., & Hidayati, R. N. (2018). Literature Review: Pemanfaatan Media Promosi Kesehatan (Smartphone) Dalam Mencegah Dan Mengendalikan Kadar Gula Diabetes Tipe 2 [Literature Review: Utilization of Health Promotion Media (Smartphones) in Preventing and Controlling Type 2 Diabetes Sugar Lev. *Jurnal Ners Dan Kebidanan*, *5*(2), 172–177. https://doi.org/10.26699/jnk.v5i2.ART.p172-177

Andriyanto, A., & Hidayati, R. N. (2021). Improving collaboration skills among nursing students through disaster preparedness simulation. *Enfermeria Clinica*, *31*, S644–S648. https://doi.org/10.1016/j.enfcli.2021.07.010

Andriyanto, A., Janes, C., & Akbar, N. (2021). Pelaksanaan Diabetes Self-Management Education (DSME) Terhadap Kemandirian Keluarga Merawat Pasien Diabetes Mellitus. *Indonesian Journal of Nursing Health Science*, *6*(1), 23–30. https://doi.org/10.47007/ijnhs.v6i1.3670

Andriyanto, A., Rekawati, E., & Rahmadiyah, D. C. (2019). Increasing Knowledge, Attitudes, Skills, and Glucose Control in Type-2 Diabetic Patients through EMAS Interventions. *Nurse Media Journal of Nursing*, *9*(2), 141–150. https://doi.org/10.14710/nmjn.v9i2.22989

Andriyanto, A., Rekawati, E., & Rahmadiyah, D. C. (2020). Pemberdayaan pada Penderita Diabetes Tipe 2 dan Kader Kesehatan dalam Pelaksanaan Program Pos Binaan Terpadu Penyakit Tidak Menular (Posbindu PTM). *Engagement: Jurnal Pengabdian Kepada Masyarakat*, *4*(1), 201–211. https://doi.org/10.29062/engagement.v4i1.81

Andriyanto, A., Rofi'ah, I., Bahtiar, B., Wicaksono, A., Zakiyah, A., Yulianti, I., & Merbawani, R. (2022). The Effectiveness of Social Support Management of Diabetes on Glucose Control of Type 2 Diabetes Mellitus Patients: Quasi-Experiments. *Open Access Macedonian Journal of Medical Sciences*, *10*(G), 223–227. https://doi.org/10.3889/oamjms.2022.8598

Arveklev, S. H., Berg, L., Wigert, H., Morrison-Helme, M., & Lepp, M. (2018). Nursing student's experience of learning about nursing through drama. *Nurse Education in Practice*, *28*, 60–65. https://doi.org/10.1016/j.nepr.2017.09.007

Didarloo, A., Shojaeizadeh, D., & Alizadeh, M. (2016). Impact of educational intervention based on interactive approaches on beliefs, behavior, hemoglobin a1c, and quality of life in diabetic women. *International Journal of Preventive Medicine*, *2016*(FEBRUARY). https://doi.org/10.4103/2008-7802.176004

Dwi, A., Amatayakul, A., & Karuncharernpanit, S. (2017). International Journal of Nursing Sciences Predictors of diabetes self-management among type 2 diabetics in Indonesia : Application theory of the health promotion model. *International Journal of Nursing Sciences*, *4*(3), 260–265. https://doi.org/10.1016/j.ijnss.2017.06.010

Fradianto, I., Andriyanto, A., Yuniarti, E. V., & Prameswari, V. E. (2023). Differences in Glucose Control of Diabetic Patients with Family Care Support Interventions. *Malaysian Journal of Nursing*, *14*(03), 110–115. https://doi.org/10.31674/mjn.2023.v14i03.013

Hein, M., Lanquart, J., Loas, G., Hubain, P., & Linkowski, P. (2017). Author ' s Accepted

Manuscript sleep examinations. *Psychosomatics*. https://doi.org/10.1016/j.psym.2017.11.003

Joseph, J. J., Echouffo-tcheugui, J. B., Talegawkar, S. A., Effoe, V. S., Okhomina, V., Carnethon, M. R., Hsueh, W. A., & Golden, S. H. (2017). Modifiable Lifestyle Risk Factors and Incident Diabetes in African Americans. *American Journal of Preventive Medicine*, *53*(5), e165–e174. https://doi.org/10.1016/j.amepre.2017.06.018

Kemenkes. (2018). *MENKES: Mari Kita Cegah Diabetes Dengan Cerdik*. Kementerian Kesehatan Republik Indonesia. https://sehatnegeriku.kemkes.go.id/baca/rilis-media/20160407/4514694/menkes-mari-kita-cegah-diabetes-dengan-cerdik/

Kemenkes. (2020). *Pusat Data dan Informasi Kementerian Kesehatan RI [Center for Data and Information Ministry of Health RI]*. https://www.google.com/url?sa=t&source=web&rct=j&url=https://pusdatin.kemkes.go.id/download.php%3Ffile%3Ddownload/pusdatin/infodatin/Infodatin-2020-Diabetes-Melitus.pdf&ved=2ahUKEwigj_qQxOz1AhUyUGwGHVGQB9AQFnoECCIQAQ&usg=AOvVaw1zFMCkHp_MBnIYs9NBk7hk

Lari, H., Tahmasebi, R., & Noroozi, A. (2017). Diabetes & Metabolic Syndrome : Clinical Research & Reviews Effect of electronic education based on health promotion model on physical activity in diabetic patients. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 6–11. https://doi.org/10.1016/j.dsx.2017.08.013

Luthfa, I., & Ardian, I. (2019). Effects of Family Empowerment on Increasing Family Support in Patients with Type-2 Diabetes Mellitus. *Nurse Media Journal of Nursing*, *9*(1), 58–68. https://doi.org/10.14710/nmjn.v9i1.22501

Mustika, I. W., Sudiantara, K., & Lestari, A. S. (2021). Health education with audiovisual media and relaxation massage in lowering blood pressure and improved sleep quality for the elderly. *Open Access Macedonian Journal of Medical Sciences*, *9*, 118–123. https://doi.org/10.3889/oamjms.2021.6781

Nugraheni, W. P., Hartono, R. K., Humaniora, P., Kesehatan, M., Penelitian, B., Kesehatan, P., Tinggi, S., Kesehatan, I., & Maju, I. (2018). Strategi Penguatan Program Posbindu Penyakit Tidak Menular Di Kota Bogor Strengthening Strategies of Posbindu Program for Noncommunicable Diseases in Bogor City. *Jurnal Ilmu Kesehatan Masyarakat*, *9*(3), 198–206. https://doi.org/10.26553/jikm.2018.9.3

Radhika, J., Poomalai, G., Nalini, S. J., & Revathi, R. (2020). Effectiveness of Buerger-Allen exercise on lower extremity perfusion and peripheral neuropathy symptoms among patients with diabetes mellitus. *Iranian Journal of Nursing and Midwifery Research*, *25*(4), 291–295. https://doi.org/10.4103/ijnmr.IJNMR_63_19

Reynolds, A. C., Paterson, J. L., Ferguson, S. A., Stanley, D., Wright, K. P., & Dawson, D. (2017). The shift work and health research agenda: Considering changes in gut microbiota as a pathway linking shift work, sleep loss and circadian misalignment, and metabolic disease. *Sleep Medicine Reviews*, *34*, 3–9. https://doi.org/10.1016/j.smrv.2016.06.009

Riskesdas. (2018). *Riset Kesehatan Dasar Tahun 2018 - Kementerian Kesehatan [Basic Health Research 2018 - Ministry of Health]*. https://www.kemkes.go.id/resources/download/info-terkini/hasil-riskesdas-2018.pdf

Rustam, J. S., & Putri, A. (2021). Effects of Diabetic Camp on Self Efficacy Among Middle-Aged and Elderly People With Type 2 Diabetes Mellitus. *The Malaysian Journal of Nursing*, *12*(3), 106–110. https://doi.org/10.31674/mjn.2021.v12i03.012

Soltanian, A. R., Borzouei, S., & Afkhami-Ardekan, M. (2017). Design, developing, and validation a questionnaire to assess general population awareness about type II diabetes disease and its complications. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, *11*, S39–S43. https://doi.org/10.1016/j.dsx.2016.09.002

Spurr, S., Bally, J., Bullin, C., & Trinder, K. (2017). Journal of Pediatric Nursing Type 2 Diabetes in Canadian Aboriginal Adolescents : Risk Factors and Prevalence. *Journal of Pediatric Nursing*, *36*, 111–117. https://doi.org/10.1016/j.pedn.2017.05.011

Stanhope, M., & Lancaster, J. (2016). *Foundations of Nursing in The Community: Community-Oriented Practice*. by Mosby, Inc., an affiliate of Elsevier Inc.

Tan, E., Khoo, J., Gani, L. U., Malakar, R. D., Tay, T. L., Tirukonda, P. S., Kam, J. W., Tin, A. S., & Tang, T. Y. (2019). Effect of multidisciplinary intensive targeted care in improving diabetes mellitus outcomes: A randomized controlled pilot study - The Integrated Diabetes Education, Awareness and Lifestyle Modification in Singapore (IDEALS) Program. *Trials*, *20*(1), 1–10. https://doi.org/10.1186/s13063-019-3601-3

Vural, S., Bostanci, S., Koçyigit, P., Çaliskan, D., Baskal, N., & Aydin, N. (2018). Risk Factors and Frequency of Ingrown Nails in Adult Diabetic Patients. *Journal of Foot and Ankle Surgery*, *57*(2), 289–295. https://doi.org/10.1053/j.jfas.2017.10.006

Wang, L.-W., Ou, S.-H., Tsai, C.-S., Chang, Y.-C., & Kao, C.-W. (2016). Multimedia exercise training program improves distance walked, heart rate recovery, and self-efficacy in cardiac surgery patients. J Cardiovasc Nurs. *The Journal of Cardiovascular Nursing*, 31(4):343–9. https://doi.org/10.1097/JCN.0000000000000246

William T. Cefalu, M. (2017). Standards of Medical Care in Diabetes - 2017. *American Diabetes Association*, *40* (Supplement 1). www.diabetes.org/diabetescare

Windartik, E., Rahmawati, I., Jariyah, I. A., Merbawani, R., Lestari, I., Ro'ifah, I., & Andriyanto, A. (2019). The Degree of Diabetic Wounds Affects Kidney Function Damage. *Nurse Media Journal of Nursing*, *9*(2), 159–166. https://doi.org/10.14710/nmjn.v9i2.24210