THE EFFECTIVENESS OF PATIENT DECISION AID IN THE MANAGEMENT OF DIABETES MEDICATION TO IMPROVE PATIENT DECISION, MEDICATION KNOWLEDGE AND THERAPEUTIC OUTCOME

Lisa Aditama, Fiorentina Yulia

Faculty of Pharmacy The University of Surabaya Indonesia

ABSTRACT

Background : The effectiveness of medication therapy can be influence by patient decision in the drug use processes. There might be lack of knowledge about medication and regiment therapy, so then influence the therapeutic outcome. While taking a decision for their medication, patient need the collaboration with their health practitioner to decide the optimal therapy. To support patients in decision-making, required an innovation instrument as patient decision aid (PDA).
Objective : The study aimed to see the effectiveness of PDA to help patients in decision-making for their medication also improve medication knowledge and therapeutic outcome.
Methods : The study designed by experimental one group (pre-post study), involved of 25 patients in the community pharmacy at House of Diabetes University of Surabaya. The measure of patient decision used the Decision Conflict Scale (DCS) with 5 domains (uncertainty, informed, clarity values, support, effective decision), patient medication knowledge and blood glucose level as therapeutic outcome, each analyzed by statistical tests.
Results : The study obtained that there is no significant difference after provision of PDA, but significant improve in patient medication knowledge and therapeutic outcome.
Conclusion : For the successful helping patients participate in decision-making for their treatment need pharmacist roles to improve their medication knowledge, blood glucose monitoring also continuous follow-up and evaluation the treatment of type 2 diabetes mellitus.

Keywords: Patient Decision Aid, Medication Knowledge, Type 2 Diabetes Melitus Treatment.

BACKGROUND

Diabetes is a chronic, progressive disease characterized by elevated levels of blood glucose. Diabetes of all types can lead to complications in many parts of the body and can increase the overall risk of premature death. Countries have committed to stop the rise in diabetes, to reduce diabetes-related mortality and to improve access to essential diabetes medicines and basic technologies. Effective tools are available to prevent type 2 diabetes and to improve management to reduce the complications and premature death that can result from all types of diabetes[1].

In general, primary health-care practitioners in low-income countries do not have access to the basic technologies needed to help people with diabetes manage their disease properly. Only one in three low- and middle-income countries report that the most basic technologies

for diabetes diagnosis and management are generally available in primary health-care facilities[1].

Diabetes and its complications are major causes of death and has a substantial economic impact on countries and national health systems. Most countries have seen a continuous increase in diabetes. International Diabetes Federation (IDF) estimated 1 in 10 adults will have diabetes for the year 2040, and 1 in 2 adults with diabetes was undiagnosed. Educational programmes needed to improve the management of people with diabetes, public health education is needed at the population level to encourage behaviour change to prevent type 2 diabetes. Countries which high prevalence for diabetes need to develop and implement cost-effective program to improve the health outcomes for people with diabetes and prevent new cases[2].

Indonesia was the 7th in top ten countries for number of adult with diabetes[2]. Health systems in Indonesia just started a managed care health coverage BPJS from 2014. There are many condition need to improve for better control of the disease, especially in chronic care disease. The most problems in Indonesia was highly need access to medication and increase care of disease complication especially caused by diabetes, hypertension and cancer. It need an action to promote diabetes care, prevention and cure the disease, also takes a leading role in influencing policy, increasing public awareness and encouraging improvements in health[3].

Many factors may affect treatment compliance, particularly commitments to taking medication in treating the disease, concerns about side effects, and medical expenses. Patients with Type 2 DM, have a wide and diverse range of issues, which can be a tremendous challenge for doctors and patients. Several factors may affect adherence to the treatment of diabetes patients, knowledge of the disease, perceptions of the benefits and roles of antidiabetic drugs, treatment costs, actual or potential side effects, complex dosing regimens, and patient characteristics[4].

Things that may affect the success of therapy are in making treatment decisions. Therefore, to achieve results in the success of the treatment it is necessary to care that can be in the form of counseling and information that helps patients participate in health care decision making, by health care providers, to improve the quality of life and prevent patients from worsening conditions and complications[5]. Therefore, an instrument or media that can help collaboration between patients and health providers, called Patient Decision Aid (PDA), which may be formed as leaflet, brochure, interactive media, video /DVD or audio cassette. These media are not intended to replace patient interactions with healthcare providers, but are intended to assist patients in decision-making treatment[6].

The use of PDA is important because the perception of each patient may be different from the intervention of the health care providers. PDA will help patient to increase knowledge and understanding of information, to choose the type of medicine to gain better expectations and more realistic clinical outcomes.

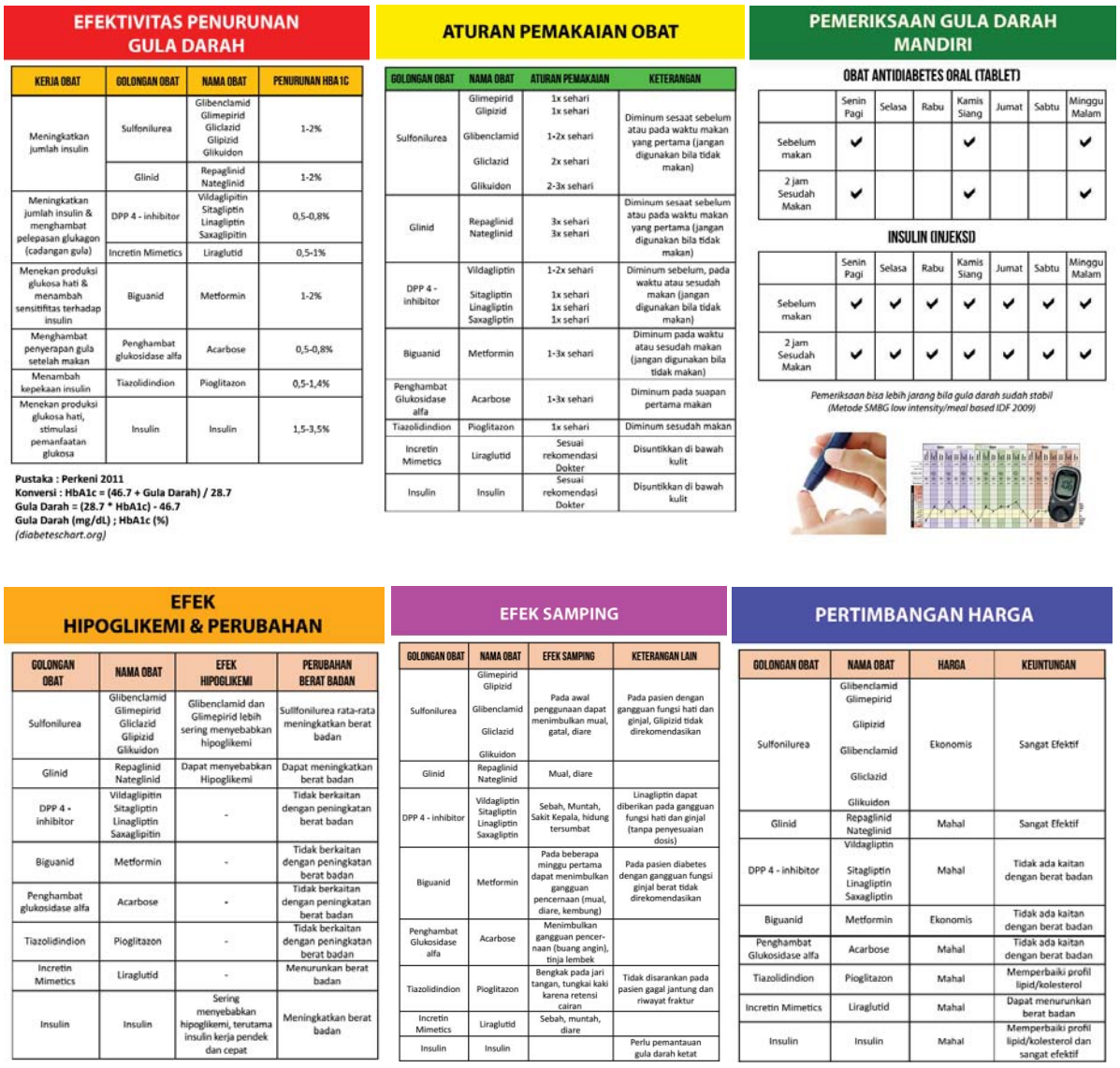
The important role of healthcare professional was to enhance patient's knowledge and self management for better outcomes[7]. There is many condition that affect patient's readiness to

change after receiving an information from health practitioner. This led patients hard to make a decision to use the medication on the right rule to control the disease[6].

In this study patients were given interventional use of PDA, to get outcome in the form of increased patients understanding on their diabetes treatment as well as more effective decision-making on treatment and therapeutic outcome.

MATERIALS AND METHOD

This study used a pre-experimental research design "the one group pre-test and post-test design". The population of this study were patients with type 2 diabetes outpatients who used oral antidiabetic (OAD) therapy, who had not reached the therapeutic target, managed by Rumah Diabetes University of Surabaya. The sample size was 25 subjects, calculated using slovin formula. The subjects were given PDA in the form of a card as a tool to assist patients in making decisions of their diabetes treatment (Figure 1).



EFEKTIVITAS PENURUNAN GULA DARAH

KERJA OBAT	GOLONGAN OBAT	NAMA OBAT	PENURUNAN HBA 1C
Meningkatkan jumlah insulin	Sulfonilurea	Glibenclamid Glimepirid Gliclazid Glipizid Glikuidon	1-2%
	Glinid	Repaglinid Nateglinid	1-2%
Meningkatkan jumlah insulin & menghambat pelepasan glukagon (cadangan gula)	DPP 4 - inhibitor	Vildagliptin Sitagliptin Linagliptin Saxagliptin	0,5-0,8%
	Incretin Mimetics	Liraglutid	0,5-1%
Menekan produksi glukosa hati & menambah sensitifitas terhadap insulin	Biguanid	Metformin	1-2%
Menghambat penyerapan gula setelah makan	Penghambat glukosidase alfa	Acarbose	0,5-0,8%
Menambah kepekaan insulin	Tiazolidindion	Pioglitazon	0,5-1,4%
Menekan produksi glukosa hati, stimulasi pemanfaatan glukosa	Insulin	Insulin	1,5-3,5%

Pustaka : Perkeni 2011
Konversi : HbA1c = (46.7 + Gula Darah) / 28.7
Gula Darah = (28.7 * HbA1c) - 46.7
Gula Darah (mg/dL) ; HbA1c (%)
(diabeteschart.org)

ATURAN PEMAKAIAN OBAT

GOLONGAN OBAT	NAMA OBAT	ATURAN PEMAKAIAN	KETERANGAN
Sulfonilurea	Glimepirid Glipizid Glibenclamid Gliclazid Glikuidon	1x sehari 1x sehari 1-2x sehari 2x sehari 2-3x sehari	Diminum sesaat sebelum atau pada waktu makan yang pertama (jangan digunakan bila tidak makan)
Glinid	Repaglinid Nateglinid	3x sehari 3x sehari	Diminum sesaat sebelum atau pada waktu makan yang pertama (jangan digunakan bila tidak makan)
DPP 4 - inhibitor	Vildagliptin Sitagliptin Linagliptin Saxagliptin	1-2x sehari 1x sehari 1x sehari 1x sehari	Diminum sebelum, pada waktu atau sesudah makan (jangan digunakan bila tidak makan)
Biguanid	Metformin	1-3x sehari	Diminum pada waktu atau sesudah makan (jangan digunakan bila tidak makan)
Penghambat Glukosidase alfa	Acarbose	1-3x sehari	Diminum pada suapan pertama makan
Tiazolidindion	Pioglitazon	1x sehari	Diminum sesudah makan
Incretin Mimetics	Liraglutid	Sesuai rekomendasi Dokter	Disuntikkan di bawah kulit
Insulin	Insulin	Sesuai rekomendasi Dokter	Disuntikkan di bawah kulit

PEMERIKSAAN GULA DARAH MANDIRI

OBAT ANTIDIABETES ORAL (TABLET)

	Senin Pagi	Selasa	Rabu	Kamis Siang	Jumat	Sabtu	Minggu Malam
Sebelum makan	✔			✔			✔
2 jam Sesudah Makan	✔			✔			✔

INSULIN (INJEKSI)

	Senin Pagi	Selasa	Rabu	Kamis Siang	Jumat	Sabtu	Minggu Malam
Sebelum makan	✔	✔	✔	✔	✔	✔	✔
2 jam Sesudah Makan	✔	✔	✔	✔	✔	✔	✔

Pemeriksaan bisa lebih jarang bila gula darah sudah stabil
(Metode SMBG low intensity/meal based IDF 2009)

EFEK HIPOGLIKEMI & PERUBAHAN

GOLONGAN OBAT	NAMA OBAT	EFEK HIPOGLIKEMI	PERUBAHAN BERAT BADAN
Sulfonilurea	Glibenclamid Glimepirid Gliclazid Glipizid Glikuidon	Glibenclamid dan Glimepirid lebih sering menyebabkan hipoglikemi	Sulfonilurea rata-rata meningkatkan berat badan
Glinid	Repaglinid Nateglinid	Dapat menyebabkan Hipoglikemi	Dapat meningkatkan berat badan
DPP 4 - inhibitor	Vildagliptin Sitagliptin Linagliptin Saxagliptin	-	Tidak berkaitan dengan peningkatan berat badan
Biguanid	Metformin	-	Tidak berkaitan dengan peningkatan berat badan
Penghambat glukosidase alfa	Acarbose	-	Tidak berkaitan dengan peningkatan berat badan
Tiazolidindion	Pioglitazon	-	Tidak berkaitan dengan peningkatan berat badan
Incretin Mimetics	Liraglutid	-	Menurunkan berat badan
Insulin	Insulin	Sering menyebabkan hipoglikemi, terutama insulin kerja pendek dan cepat	Meningkatkan berat badan

EFEK SAMPING

GOLONGAN OBAT	NAMA OBAT	EFEK SAMPING	KETERANGAN LAIN
Sulfonilurea	Glimepirid Glipizid Glibenclamid Gliclazid Glikuidon	Pada awal penggunaan dapat menimbulkan mual, gatal, diare	Pada pasien dengan gangguan fungsi hati dan ginjal, Glipizid tidak direkomendasikan
Glinid	Repaglinid Nateglinid	Mual, diare	
DPP 4 - inhibitor	Vildagliptin Sitagliptin Linagliptin Saxagliptin	Sebah, Muntah, Sakit Kepala, hidung tersumbat	Linagliptin dapat diberikan pada gangguan fungsi hati dan ginjal (tanpa penyesuaian dosis)
Biguanid	Metformin	Pada beberapa minggu pertama dapat menimbulkan gangguan pencernaan (mual, diare, kembung)	Pada pasien diabetes dengan gangguan fungsi ginjal berat tidak direkomendasikan
Penghambat Glukosidase alfa	Acarbose	Menimbulkan gangguan pencer-naan (buang angin), tinja lembek	
Tiazolidindion	Pioglitazon	Bengkak pada jari tangan, tungkai kaki karena retensi cairan	Tidak disarankan pada pasien gagal jantung dan riwayat fraktur
Incretin Mimetics	Liraglutid	Sebah, muntah, diare	
Insulin	Insulin		Perlu pemantauan gula darah ketat

PERTIMBANGAN HARGA

GOLONGAN OBAT	NAMA OBAT	HARGA	KEUNTUNGAN
Sulfonilurea	Glibenclamid Glimepirid Glipizid Glibenclamid Gliclazid Glikuidon	Ekonomis	Sangat Efektif
Glinid	Repaglinid Nateglinid	Mahal	Sangat Efektif
DPP 4 - inhibitor	Vildagliptin Sitagliptin Linagliptin Saxagliptin	Mahal	Tidak ada kaitan dengan berat badan
Biguanid	Metformin	Ekonomis	Tidak ada kaitan dengan berat badan
Penghambat Glukosidase alfa	Acarbose	Mahal	Tidak ada kaitan dengan berat badan
Tiazolidindion	Pioglitazon	Mahal	Memperbaiki profil lipid/kolesterol
Incretin Mimetics	Liraglutid	Mahal	Dapat menurunkan berat badan
Insulin	Insulin	Mahal	Memperbaiki profil lipid/kolesterol dan sangat efektif

Figure 1. PDA Cards

Subjects were given an explanation of how to use PDA. After four weeks, had been measured the differences in patient knowledge, decision making, blood glucose level and analyzed using statistic paired t-test (Figure 2).

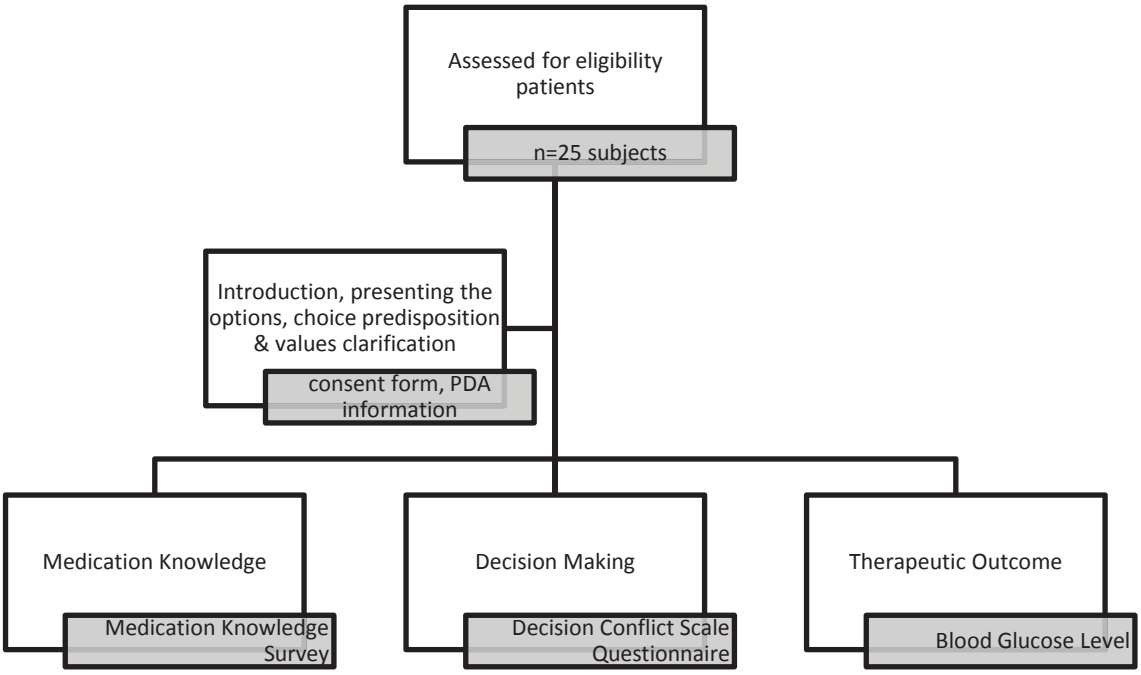


Figure 2. Participant Flow Diagram

The measuring instruments used were medication knowledge survey (derived from Case Management Adherence Guideline[8]), decision conflict scale (DCS) questionnaire (AM O'Connor[9]) and accuchek® glucometer.

Medication knowledge survey ask the patient the following questions about every one of their medications[8]:

a. Name of the medication? (Can the patient read the label? Note: Incorrect pronunciation is not considered a failure on the patient's part to identify medication.
b. Why is the medication being taken? (for what disease or condition?)
c. How much medication (number of pills) are to be taken each time?
d. When is the medication to be taken? (morning, before meals, twice a day, etc.)
e. What effects should the patient be looking for ? (both positive and negative)
f. Where is the medication kept? (to ascertain special storage conditions needed)
g. When is the next refill due? (and plan or methods for obtaining refills of the medication)

The score for calculating the Medication Knowledge Survey is to use the value of the total ratio examined from each question to the total of questions on a scale of 0 to 8. There are a total of 8 answers for each drug. Code 0 if score of the survey <50% was classified as low patient's medication knowledge. Code 1 if score of the survey >50-70% was classified as moderate patient's medication knowledge. Code 2 if score of the survey >70-90% was classified as high patient's medication knowledge. Code 3 if score of the survey >90% was

classified as very high patient's medication knowledge. If the patient gets more than one drug, the number of drugs will be multiplied by eight. Then the result or value is divided by the value obtained by the patient. Medication knowledge level will analyze with Wilcoxon matched pairs test.

The decisional conflict scale measures personal perception of uncertainty in chosing options, feeling uninformed, unclear about personal values, unsupported in decision making, and effective decision making[9].

Each part of the question consists of 5 ranking scores: 0 = 'strongly agree'; 1 = 'agree'; 2 = 'doubt'; 3 = 'disagree'; 4 = 'strongly disagree'. Calculate 16 parts of each answered question, A) Summed, then; B) divided by number 16 then; C) multiplied by the number 25. The range of score scores from the value 0 (no decision conflict) to 100 (a very high conflict conflict), classified into 3 category : if score 0-25 was classified as good decision making, 26-50 was classified as moderate decision making and >50 as low decision making.

RESULTS AND DISCUSSION

Intervention in this study was conducted for four weeks for each subject in the period of March to June 2016. The variables studied include independent variable, that is PDA as a tool for medication aid and dependent variable, that is patient's medication knowledge, blood glucose levels and treatment decisions using the DCS questionnaire. Patient baseline characteristics describe as in table 1:

Table 1. Patient Baseline Characteristics

Patient Characteristics		n=25	Proportion (%)
Gender	Male	19	76
	Female	6	24
Age (years old)	>18-25	1	4
	26-35	1	4
	36-45	4	16
	46-55	8	32
	56-65	11	44
Duration of Diabetes (year)	1 - 5	12	48
	6 - 10	8	32
	11- 15	5	20

Medication Knowledge Survey After PDA Administration

Medication knowledge includes the knowledge of name of the medicine, the composition, the purpose and the amount of medicine at each use, the positive effects and the negative effects, the drug storage, also the date of drug next purchase. PDA administration will help patient to manage their medication regiment for the beneficial outcomes. In this study the average knowledge of research subjects was good. Results of a medication knowledge survey conducted over four weeks after provide PDA, that shows all respondents have a high knowledge of the antidiabetic drugs used.

Table 2. Patient's Medication Knowledge after PDA Administration

Medication Knowledge Category	Sebelum		Sesudah	
	Frekuensi	Presentase (%)	Frekuensi	Presentase (%)
Code 0 (low patient's medication knowledge)	0	0	0	0
Code 1 (moderate patient's medication knowledge)	3	12	0	0
Code 2 (high patient's medication knowledge)	22	88	19	76
Code 3 (very high patient's medication knowledge)	0	0	6	24
Total	25	100	25	100

Table 3. Statistical Analysis of Patient's Medication Knowledge After PDA Administration

Test Statistics[b,c]

			sesudah - sebelum
Z			-3.000[a]
Asymp. Sig. (2-tailed)			.003
Monte Carlo Sig. (2-tailed)	Sig.		.004
	95% Confidence Interval	Lower Bound	.002
		Upper Bound	.005
Monte Carlo Sig. (1-tailed)	95% Confidence Interval	Lower Bound	.001
		Upper Bound	.002
	Sig.		.001

Based on the above results shows p value (Asymp Sig 2 tailed) of 0.003, less than the critical limit of the study 0.05 so it can be concluded that there is a difference significance of drug knowledge on the pre and post PDA administration.

Blood Glucose Level After PDA Administration

In major clinical trials, the use of Self Monitoring Blood Glucose (SMBG) for glycemic control is useful as a multifactorial intervention. In this intervention with PDA, shows that SMBG can be an effective therapy component. SMBG allows patients to evaluate their individual response to therapy and assess whether the target glycemic is or has been achieved. SMBG results can be useful in preventing hypoglycemia and drug adjustment (especially prandial insulin dose), nutritional therapy, and physical activity. In a recent meta-analysis it was shown that SMBG patients with Type 2 DM of OAD therapy could decrease HbA1c values by 0.25% in the first 6 months, while from Review Cochrane concluded that the overall SMBG effect in Type 2 DM patients was relatively small at 6 months After initiation and decreased after 12 months (Diabetes Care, 2013).

Table 4. Blood Glucose Monitoring After PDA Administration

Subject No	Week-1 (mg/dL)	Week-2 (mg/dL)	Week-3 (mg/dL)	Week-4 (mg/dL)
1	276.0	449.0	291.0	271.0
2	222.0	336.0	146.0	101.0
3	207.0	140.0	243.0	176.0
4	216.0	201.0	170.0	155.0
5	222.0	179.0	181.0	158.0
6	339.0	305.0	324.0	292.0
7	254.0	186.0	131.0	126.0
8	278.0	143.0	144.0	304.0
9	214.0	85.0	122.0	108.0
10	187.0	135.0	170.0	72.0
11	281.0	380.0	204.0	79.0
12	266.0	188.0	167.0	276.0
13	214.0	170.0	186.0	125.0
14	230.0	184.0	105.0	163.0
15	330.0	480.0	381.0	288.0
16	136.0	110.0	109.0	128.0
17	340.0	397.0	302.0	260.0
18	199.0	155.0	167.0	154.0
19	198.0	103.0	88.0	109.0
20	216.0	108.0	176.0	116.0
21	186.0	130.0	142.0	191.0
22	360.0	321.0	292.0	341.0
23	185.0	130.0	107.0	120.0
24	272.0	262.0	214.0	186.0
25	368.0	226.0	121.0	270.0

Note : Blood glucose level measure as random blood glucose (about 3 hours after first meal) from capillary blood vessel using Accuchek® glucometer.

Table 5. Statistical Analysis of Blood Glucose Level After PDA Administration

ANOVA

HASIL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	69742.990	3	23247.663	3.176	.028
Within Groups	702694.000	96	7319.729		
Total	772436.990	99			

Based on the above results shows the significance of 0.028 where less than the critical limit of the research 0.05 which means there are significant differences in the study subjects on the effect of blood glucose level before and after PDA administration.

Decision Conflict Scale After PDA Administration

Table 6. Decision Conflict Scale After PDA Administration

Domain	Test	Sig Value	Conclusion
Informed Subscale (feeling uninformed)	*Wilcoxon Matched Pairs Test*	0,480	No significant differences
Values Clarity Subscale (unclear about personal values)	*Wilcoxon Matched Pairs Test*	0,257	No significant differences
Support Subscale (unsupported in decision making)	*Wilcoxon Matched Pairs Test*	0,655	No significant differences
Uncertainty (personal perception of uncertainty in chosing options)	*Wilcoxon Matched Pairs Test*	0,527	No significant differences
Effective Decision Subscale (effective decision making)	*Wilcoxon Matched Pairs Test*	0,157	No significant differences

From the results of the research indicating there were no significant differences between pre and post PDA administration. It can be concluded that decision making may be influenced by many factors such as the delivery of PDA information to the patient, the patient's condition includes emotional level and stress level with their disease condition. The degree of uncertainty as in making decisions involving the benefits and risks of OAD also affects the patient in making a decision. On the other hand the provision of PDA is successful in assisting in digging things that have not been submitted by doctors or other health care provider to patients[10,11,12,13]. For example, regarding weight change, when patients and physicians discuss weight changes in a treatment, generally weight changes refer to the context of glycemic control rather than as a potential side effect of the drug. However PDA also received rave reviews from research subjects as many of the research subjects had never received an explanation of OAD before.

LIMITATIONS

This study was conducted at single treatment cycle period, while the patient characteristics had never received previous PDA intervention, so it has not been able to give any changes in the decision making process. PDA card has not provided information related to the description of the condition of diabetes and the need to manage treatment continuously.

CONCLUSIONS

From the intervention of PDA administration, there are several things that change in the research subjects include: increased medication knowledge, and better therapeutic target as seen in random blood glucose level monitoring. PDA will succeed in becoming one of the tools in engaging or involving patients in clarifying values and expectations that are more

realistic in their medication knowledge, but less contribute to decision making, this is possible because PDA are still new to the research subject, so they have no experience in making decisions treatment.

For the successful helping patients participate in decision-making for their treatment need pharmacist roles to improve their medication knowledge, blood glucose monitoring also continuous follow-up and evaluation the treatment of type 2 diabetes mellitus.

REFERENCES

1. World Health Organization. Global Report on Diabetes. 2016
2. International Diabetes Federation, Diabetes Atlas 7th edition. 2015
3. Ministry of Health of the Republic of Indonesia. Ministry of Health Strategic Plan 2015-2019. 2015
4. Tunceli K, Zhao C, Davies MJ, et al. Factors Associated With Adherence to Oral Antihyperglycemic Monotherapy In Patients With Type 2 Diabetes. Patient Preference and Adherence 2015:9 191–197
5. Mathers N, Ng CJ, Campbell NJ, et al. Clinical effectiveness of a patient decision aid to improve decision quality and glycaemic control in people with diabetes making treatment choices: a cluster randomised controlled trial (PANDAs) in general practice. BMJ Vol 2. 2012
6. Chow, S et al., 2009. Shared Decision Making: Helping The System And Patiens Make Quality Health Care Decision; by, Saskatoon Health Quality Council.
7. American Diabetes Association Standards of Medical Care in Diabetes. The Journal of Clinical and Applied Research and Education Diabetes Care Vol 39/Suplement 1. 2016
8. Case Management Society of America. Case Management Adherence Guideline version 2.0: Guidelines from the Case Management Society of America for improving patient adherence to medication therapies. 2006
9. O'Connor AM. User Manual Decision Conflict Scale-1993 (updated 2010). Available from www.ohri.ca/decisionaid
10. Branda ME, Blanc AL, Shah ND, et. al. Shared Decision Making For Patients with Type 2 Diabetes: A Randomized Trial In Primary Care. BMC Health Services Research 13:301. 2013.
11. Elwyn G, Frosch D, Thomson R, et,al. Shared Decision Making; A Model for Clinical Practice; NCBI. 2011.
12. Chow S, Teare G, Basky G. Shared Decision Making: Helping The System And Patiens Make Quality Health Care Decision; by, Saskatoon Health Quality Council. 2009
13. Murray E, Pollack L, White M, et.al. Clinical Decision-making; Patients Preferences And Experiences. Patient Education And Counseling Journal. 2007.
14. Stacey D, Legare F, Lewis K, *et al*. *Decision aids for people facing health treatment or screening decisions*. Cochrane Database of Systematic Reviews 2003, Issue 1. Art. No:CD001431. DOI: 10.1002/14651858.CD001431. Last assessed as up-to-date: 30 June 2006
15. Christensen, Larry B. Experimental Methodology 10th Edition. New York: Pearson Education Inc. 2010.

Unity in Diversity and the Standardisation of Clinical Pharmacy Services

Editors: Elida Zairina, Junaidi Khotib, Chrismawan Ardianto, Syed Azhar Syed Sulaiman, Charles D. Sands III and Timothy E. Welty

CRC Press
Taylor & Francis Group
A BALKEMA BOOK

PROCEEDINGS OF THE 17TH ASIAN CONFERENCE ON CLINICAL PHARMACY (ACCP 2017), 28–30 JULY 2017, YOGYAKARTA, INDONESIA

Unity in Diversity and the Standardisation of Clinical Pharmacy Services

Editors

Elida Zairina
Department of Pharmacy Practice, Faculty of Pharmacy, Universitas Airlangga, Surabaya, Indonesia

Junaidi Khotib & Chrismawan Ardianto
Department of Clinical Pharmacy, Faculty of Pharmacy, Universitas Airlangga, Surabaya, Indonesia

Syed Azhar Syed Sulaiman
Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, Penang, Malaysia

Charles D. Sands III
(Formerly) McWhorter School of Pharmacy, College of Health Sciences, Samford University, Birmingham, Alabama, USA

Timothy E. Welty
Department of Clinical Sciences, College of Pharmacy and Health Sciences, Drake University, Iowa, USA

CRC Press
Taylor & Francis Group
Boca Raton London New York Leiden

CRC Press is an imprint of the
Taylor & Francis Group, an **informa** business

A BALKEMA BOOK

CRC Press/Balkema is an imprint of the Taylor & Francis Group, an informa business

Typeset by V Publishing Solutions Pvt Ltd., Chennai, India
Printed and bound in Great Britain by CPI Group (UK) Ltd, Croydon, CR0 4YY

Published by: CRC Press/Balkema
Schipholweg 107C, 2316 XC Leiden, The Netherlands
e-mail: Pub.NL@taylorandfrancis.com
www.crcpress.com – www.taylorandfrancis.com

ISBN: 978-1-138-08172-7 (Hbk)
ISBN: 978-1-315-11275-6 (eBook)

Table of contents

Preface

The original idea of ACCP came from Asian pharmacists who were looking for a practical conference at which they could exchange and share ideas on the concept of clinical pharmacy. In 1996, representatives from China, Korea, Japan, and USA met in Seoul, Korea to plan for the first conference. As a result, the first East Asia Conference on Developing Clinical Pharmacy Practice and Clinical Pharmacy Education (EACDCPPE) was held in America in 1997. Only 36 representatives attended and pioneers planned it as bi-annual meeting.

In 1999, the second EACDCPPE was successively held in Shanghai. This conference enabled more representatives in Asian countries to realize the differences between Asian and Western countries in the development of clinical pharmacy. When the third conference was held in Japan in 2003, the title of the conference was changed to Asian Conference on Clinical Pharmacy (ACCP). This opened the conference to more Asian countries; also the subject of clinical pharmacy was more strengthened. With a series of other Asian countries such as Philippines, Indonesia, Singapore, and so on attending ACCP, as well as with the rapid development of clinical pharmacy in Asia, every country was enthusiastic about attending and holding this conference. At the 5th conference in Malaysia in 2005, the decision was made among the representatives of the member countries to hold the conference annually instead of biannually for efficiency and convenience in regard to communicating and sharing about clinical pharmacy.

During the past 20 years, ACCP has been a major event in the clinical pharmacy scope in Asia and has been conducted in various countries especially in Asia. Clinical pharmacists have attended this prestigious meeting to share their experience in the fields of practice, research, and education on clinical pharmacy. Clinical pharmacist experts from USA, Canada, Australia, and UK have continuously come to transfer their knowledge and shared advance clinical pharmacy practice experiences. This conference supports rapid knowledge and experience transfer and enhances the emergence of clinical pharmacy practice in Asia.

Indonesia hosted the 8th ACCP in Surabaya in 2008, and again this year Indonesia has successfully hosted the 17th ACCP in Yogyakarta from 28th to 30th July 2017. This year's conference was also a celebration of 20 years of ACCP with the theme "Unity in Diversity and the Standardisation of Clinical Pharmacy Services." At ACCP 2017, there were 6 preconference workshops, poster sessions consisted of 199 posters, 21 oral presentation sessions consisted of a total of 142 oral presentations, and there were symposiums with 47 speakers, 2 plenary sessions with 4 speakers and 4 keynote speeches regarding various current issues in clinical pharmacy. About 1,133 participants attended the conference from 16 different countries.

This ACCP 2017 proceeding provides an opportunity for readers to engage with selected papers presented at the 17th ACCP 2017. This book is also a valuable contribution to gaining a better understanding about the development of clinical pharmacy particularly in Asian countries and the future global challenges. Readers will find a broad range of research reports on topics of clinical pharmacy, social and administrative pharmacy, pharmacy education, pharmacoeconomics, pharmacoepidemiology and other topics in pharmacy. The readers will also discover both common challenges and creative solutions emerging from diverse settings in developing clinical pharmacy services.

The editors would like to thank all those who have contributed to submit full papers for this 17th ACCP conference. We received 119 papers from the conference and after a rigorous peer-review, 68 papers were accepted for publication in this proceeding of which 56 are from Indonesia and 12 from Australia, Malaysia, the Philippines, and Thailand. We would like to express our special appreciation and sincere thanks to the scientific committee and the reviewers who have selected and reviewed the papers, and also the technical editor's team (Ms Arie Sulistyarini and Ms Muffarihah) who helped carry out the page layout and check the consistency of the papers with the publisher's template. It is a great honour to publish selected papers in this proceeding by CRC Press/Balkema (Taylor & Francis Group). Our special gratitude goes to the steering committee, the chairman of the conference and the members of the organizing committee involved in preparing and organizing the conference. Finally, we would like to thank Universitas Airlangga, Indonesian Pharmacist Association, Universitas Gadjah Mada, Universitas Ahmad Dahlan,

Universitas Islam Indonesia, Universitas Muhammadiyah Yogyakarta and Universitas Sanata Dharma for their endless support during the conference. Last, but not least, we also place on record our sense of gratitude to one and all who, directly or indirectly, have lent a helping hand to this conference.

The Editorial Board of the 17th ACCP Proceeding—Unity in Diversity and the Standardisation of Clinical Pharmacy Services

Dr. Elida Zairina
Department of Pharmacy Practice, Faculty of Pharmacy, Universitas Airlangga, Surabaya, Indonesia

Dr. Junaidi Khotib & Dr. Chrismawan Ardianto
Department of Clinical Pharmacy, Faculty of Pharmacy, Universitas Airlangga, Surabaya, Indonesia

Prof. Syed Azhar Syed Sulaiman
Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, Penang, Malaysia

Prof. Charles D. Sands III
Former Dean and Professor (retired), McWhorter School of Pharmacy, College of Health Sciences, Samford University, Birmingham, Alabama, USA

Prof. Timothy E. Welty
Department of Clinical Sciences, College of Pharmacy and Health Sciences, Drake University, Iowa, USA

Organizing committee

ADVISORS

Mohammad Nasih, *Rector of Universitas Airlangga, Indonesia*
Nurul Falah Eddy Pariang, *President of Indonesian Pharmacist Association, Indonesia*

INTERNATIONAL ADVISORY BOARD

Suharjono, *Faculty of Pharmacy, Universitas Airlangga, Indonesia*
Junaidi Khotib, *Faculty of Pharmacy, Universitas Airlangga, Indonesia*
Yunita Nita, *Faculty of Pharmacy, Universitas Airlangga, Indonesia*
Aris Widayati, *Faculty of Pharmacy, Universitas Sanata Dharma, Indonesia*
Dyah Aryani Perwitasari, *Faculty of Pharmacy, Universitas Ahmad Dahlan, Indonesia*
Surakit Nathisuwan, *Faculty of Pharmacy, Mahidol University, Thailand*
Suphat Subongkot, *Faculty of Pharmaceutical Sciences, Khon Kaen University, Thailand*
Roger D. Lander, *McWorther School of Pharmacy, Samford University, USA*
Timothy E. Welty, *College of Pharmacy and Health Sciences, Drake University, USA*
Charles D. Sands III, *Former Dean and Professor (retired), McWhorter School of Pharmacy, Samford University, USA*
Alexandre Chan, *Department of Pharmacy, National University of Singapore, Singapore*
Priscilla How, *Department of Pharmacy, National University of Singapore, Singapore*
Syed Azhar Syed Sulaiman, *School of Pharmaceutical Sciences, Universiti Sains Malaysia*
Hiroyuki Kamei, *Faculty of Pharmacy, Meijo University, Japan*
Kwang-il Kwon, *College of Pharmacy, Chungnam National University, Korea*
Robert Sindelar, *Faculty of Pharmaceutical Sciences, The University of British Columbia, Canada*

STEERING COMMITTEE

Umi Athiyah, *Faculty of Pharmacy, Universitas Airlangga, Indonesia*
Riesta Primaharinastiti, *Faculty of Pharmacy, Universitas Airlangga, Indonesia*
Dwi Setiawan, *Faculty of Pharmacy, Universitas Airlangga, Indonesia*
Dewi Melani Haryadi, *Faculty of Pharmacy, Universitas Airlangga, Indonesia*
Wahyu Utami, *Faculty of Pharmacy, Universitas Airlangga, Indonesia*
Budi Suprapti, *Faculty of Pharmacy, Universitas Airlangga, Indonesia*
Agung Endro Nugroho, *Faculty of Pharmacy, Universitas Gadjah Mada, Indonesia*
Pinus Jumaryatno, *Faculty of Mathematics and Natural Sciences, Universitas Islam Indonesia*
Sabtanti Harimurti, *Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, Indonesia*
Chao Zhang, *Peking University Third Hospital, China*
Helen Zhang, *United Family Health Care, China*
Zhu Zhu, *Peking Union Medical College Hospital, China*
Suo-Zhong Yuan, *Chinese Pharmaceutical Association, China*
Franco Cheng, *School of Pharmacy, The Chinese University of Hongkong, Hong Kong*
Vivian Lee Wing-Yan, *School of Pharmacy, The Chinese University of Hongkong, Hong Kong*
Wan Gyoon Shin, *College of Pharmacy, Seoul National University, Korea*
Kyung Eob Choi, *College of Pharmacy, CHA University, Korea*
Jung Mi Oh, *College of Pharmacy, Seoul National University, Korea*
Hyun-Take (Thomas) Shin, *College of Pharmacy, Sookmyung Women's University, Korea*
Ramesh Adepu, *JSS College of Pharmacy, JSS University, India*
Farshad Hashemian, *Pharmaceutical Sciences Branch, Islamic Azad University, Iran*

SCIENTIFIC COMMITTEE

CONFERENCE CHAIRMAN

CONFERENCE VICE-CHAIRMAN 1

CONFERENCE VICE-CHAIRMAN 2

SECRETARY

Keynote speakers

Prof. Nila Djuwita F. Moeloek—*Minister of Health, Republic of Indonesia*

Prof. Nila Djuwita F. Moeloek is a professor at the Faculty of Medicine, Universitas Indonesia (FMUI) since 1980. She graduated as Medical Doctor from FMUI in 1968. She then started her specialty in the field of ophthalmology in Rumah Sakit Cipto Mangunkusumo (RSCM) in 1979–1988. At the same time, she also became the Coordinator of Research in Department of Opthamology, FMUI—RSCM. In 2008–2009, she was chosen as the head of Medical Research Unit FMUI—RSCM. She is also well-known in the international world, as a member as well as an editor of Orbita International Magazine since 1985 to present. Currently she is the Minister of Health of Indonesia in President Joko Widodo's Cabinet.

Prof. Lilian M. Azzopardi—*Head, Department of Pharmacy, Faculty of Medicine and Surgery, University of Malta, Malta*

Prof. Lilian M. Azzopardi studied pharmacy at the University of Malta, Faculty of Medicine and Surgery and in 1994 she took up a position at the Department of Pharmacy, University of Malta. Prof. Azzopardi is the Head of School of Pharmacy at the University of Malta and co-ordinates the teaching of pharmacy practice. She has spearheaded major developments in pharmacy education within the University of Malta including the development of a post-graduate doctorate in pharmacy offered by the University of Malta in collaboration with the University of Illinois at Chicago. She has been invited as an external examiner for postgraduate degrees in different schools of pharmacy internationally. Her research portfolio is in the area of pharmacy quality systems and pharmacist interventions in clinical settings. She has published several papers and has been invited to give lecturers and short courses in several universities. She has received

Plenary speakers

Prof. Michael D. Katz—*Professor at Department of Pharmacy Practice & Science, The University of Arizona College of Pharmacy, USA*

Prof. Michael D. Katz is Professor at the University of Arizona College of Pharmacy Department of Pharmacy Practice & Science. He practices at the University of Arizona Medical Center within the Department of Internal Medicine, His practice interests include general internal medicine, endocrinology, HIV/AIDS, infectious diseases, and evidence-based practice. Dr. Katz teaches pharmacy and medical students in both the classroom and experiential settings. He was selected in 2001 as a Dean's Teaching Scholar by the Arizona Health Sciences Center and has received numerous teaching awards. He is a Past-Chair of the American Society of Health-System Pharmacists (ASHP) Commission on Therapeutics. Dr. Katz has numerous publications and including Pharmacotherapy Principles and Practices Study Guide: A Case-Based Care Plan Approach, now in its fourth edition. Dr. Katz is the Internal Medicine PGY2 Residency Program Director and directs all residency-related activities for the College of Pharmacy. He has been involved in international education and practice for even 15 years and he serves as the College of Pharmacy's Director of International Programs. In 2010 he received the University of Arizona's prestigious Excellence in International Education Award. He has consulted and lectured extensively in Japan and many other countries regarding pharmacy education and clinical pharmacy practice and he serves as the Co-Chair of the Board of Directors of the U.S—Thai Pharmacy Consortium. Dr. Katz directs the largest program of its kind to train clinical pharmacy faculty members from Saudi Arabia.

Dr. Umi Athiyah—*A/Prof of Department of Pharmacy Practice and Dean of Faculty of Pharmacy, Universitas Airlangga, Surabaya, Indonesia*