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Lampiran 1. Informed Consent**FAKULTAS KESEHATAN MASYARAKAT****UNIVERSITAS HASANUDDIN****ANALISIS DETERMINAN KOMPLIKASI PADA PASIEN
DIABETES MELLITUS TIPE 2 DI RUMAH SAKIT
ALOEI SABOE KOTA GORONTALO**

Dengan Hormat.

Dalam rangka mengumpulkan data yang berkaitan dengan Analisis Determinan Komplikasi Pada Pasien Diabetes Mellitus Tipe 2 Di Rumah Sakit AloeI Saboe Kota Gorontalo. Saya memohon kesediaan anda meluangkan waktu untuk mengisi berbagai daftar pertanyaan yang diajukan kepada anda. Hasil penelitian ini sangat bergantung pada jawaban anda yang sejujurnya. Jawaban yang anda berikan akan terjaga kerahasiaannya.

Atas segala bantuan dan kerjasamanya yang anda berikan, kami mengucapkan terima kasih.

Hormat kami,

Peneliti

Lampiran 2. Kuesioner Penelitian



KUESIONER
ANALISIS DETERMINAN KOMPLIKASI PADA PASIEN
DIABETES MELLITUS TIPE 2 DI RUMAH SAKIT
ALOE SABOE KOTA GORONTALO

NO RESPONDEN :	
TANGGAL WAWANCARA :	

A. Karakteristik Responden		
1.	Nama responden :	
2.	Alamat responden :	
3.	Umur responden :tahun
4.	Jenis Kelamin :	<ul style="list-style-type: none"> a. Perempuan b. Laki-laki
5.	Pendidikan responden :	<ul style="list-style-type: none"> a. Tidak sekolah b. Tamat SD/MI c. Tamat SMP/SLTP d. Tamat SMA/SLTA e. D3/S1/S2/S3
6.	Pekerjaan responden :	<ul style="list-style-type: none"> a. Sopir b. Petani c. Wiraswasta d. PNS/ABRI e. Pensiunan f. Pegawai swasta g. Ibu Rumah Tangga
7.	Apakah anda mengalami komplikasi? (jika tidak, lanjut ke B1)	<ul style="list-style-type: none"> a. Ya b. Tidak
8.	Komplikasi DM apa yang anda derita?	<ul style="list-style-type: none"> a. Retinopati diabetik b. Neuropati diabetik c. Nefropati d. Jantung koroner e. Stroke f. Hipertensi
B. Usia		
1.	Sejak umur berapa anda dinyatakan menderita penyakit (retinopati, tahun

	neuropati, nefropati, pjk, stroke, dan hipertensi) tersebut?	
C. Lama Menderita DM		
1.	Sejak kapan anda didiagnosa menderita diabetes mellitus tipe 2?
D. Indeks Massa Tubuh (IMT)		
1.	Berapa berat badan anda?kg
2.	Berapa tinggi badan anda?cm
3.	Indeks Massa Tubuh (IMT)Kg/ m ²
E. Aktivitas fisik		
1. Aktivitas Fisik Berat : Aktivitas yang memerlukan tenaga fisik kuat dan minimal dilakukan dalam waktu 10 menit		
No.	Pertanyaan	Jawaban
1a	Berapa hari dalam seminggu terakhir Anda melakukan aktivitas fisik berat seperti aerobik, berlari, bersepeda/ berenang cepat, tenis/bulu tangkis single ?	1. minggu 2. Tidak ada aktivitas berjalan kaki (lanjut ke 2.a)
1b	Berapa lama waktu yang Anda gunakan untuk melakukan aktivitas fisik berat tersebut dalam sehari ?	1. jam menit/hari 2. tidak tahu/tidak pasti
2. Aktivitas Fisik Sedang : aktivitas yang menggunakan tenaga fisik sedang dan minimal dilakukan dalam waktu 10 menit		
2a	Berapa hari dalam seminggu terakhir Anda melakukan aktivitas fisik berat seperti mengangkat barang berat \geq 10 kg, (setara dengan $\frac{1}{2}$ zak beras kecil) memindah perabot rumah tangga, memotong kayu, mencangkul di sekitar rumah ?	1. minggu 2. 2. Tidak ada aktivitas berjalan kaki (lanjut ke 3.a)
2b	Berapa lama waktu yang Anda gunakan untuk melakukan aktivitas fisik sedang tersebut dalam sehari ?	1. jam menit/hari 2. tidak tahu/tidak pasti
3. Berapa lama waktu yang anda gunakan untuk berjalan kaki (termasuk berjalan kaki di tempat kerja dan di rumah, ke tempat lain, untuk rekreasi, senam, atau		

sekedar berjalan-jalan)		
3a	Berapa hari Anda rekreasi, aktivitas berjalan, olahraga dan kegiatan lain ?	1. seminggu 2. 2. Tidak ada aktivitas berjalan kaki (lanjut ke 4.a)
3b	Berapa lama waktu yang Anda gunakan untuk aktivitas berjalan kaki tersebut dalam sehari ?	1. jam menit/hari 2. tidak tahu/tidak pasti
BAGIAN 4 : Waktu yang digunakan untuk duduk		
Pertanyaan berikut adalah tentang waktu Anda yang biasa lakukan untuk duduk di rumah, ditempat kerja, mengunjungi teman, membaca atau berbaring menonton TV.		
4a	Dalam sehari, berapa lama anda biasa duduk di tempat kerja dan di rumah, waktu belajar, waktu senggang, mengunjungi orang lain, atau sekedar duduk sambil membaca atau menonton?	<u>1. jam menit/hari</u> <u>2. tidak tahu/tidak pasti</u>
<p>Total MET-menit/minggu = aktivitas berjalan (METs (3.3) x durasi (.....) x frekuensi (.....) + aktivitas duduk (METs (3.3) x durasi (.....) + aktivitas sedang (METs (4.0) x durasi (.....) x frekuensi (.....)) + aktivitas berat (METs (8.0) x durasi (.....) x frekuensi (.....)) =</p> <p>*Aktifitas fisik responden termasuk = berisiko tinggi / berisiko rendah</p> <p>*coret salah satu</p> <p>Kuesioner IPAQ (<i>International Physical Activity Questionair</i>)2005</p>		
F. Kepatuhan Minum Obat		
1.	Apakah anda kadang-kadang/pernah lupa meminum obat untuk kondisi penyakit anda?	a. Tidak b. Ya
2.	Seseorang kadang tidak minum obat karena beberapa alasan selain lupa, apakah dalam 2 minggu terakhir ada hari dimana anda tidak meminum obat anda?	a. Tidak b. Ya
3.	Pernahkah anda mengurangi atau berhenti minum obat tanpa memberitahu dokter anda karena anda merasa kondisi anda bertambah parah setelah minum obat tersebut?	a. Tidak b. Ya

4.	Ketika anda sedang berpergian, apakah anda pernah lupa membawa obat anda?	a. Tidak b. Ya
5.	Apakah kemarin anda meminum obat anda?	a. Tidak b. Ya
6.	Apakah anda pernah tidak meminum obat anda ketika anda merasa bahwa kondisi anda baik/sehat?	a. Tidak b. Ya
7.	Minum obat setiap hari adalah hal yang tidak menyenangkan, apakah anda merasa terganggu dengan jadwal minum obat anda?	a. Tidak b. Ya
8.	Seberapa sering anda merasa kesulitan mengingat untuk meminum semua obat untuk kondisi penyakit anda? a. tidak pernah b. jarang c. kadang-kadang d. sering e. selalu	

G. Self Care Behavior

Pertanyaan	Jumlah Hari							
	0	1	2	3	4	5	6	7
Pola makan								
1. Rata-rata dalam satu bulan terakhir, berapa hari dalam satu minggu anda merencanakan diet?	0	1	2	3	4	5	6	7
2. Berapa hari dalam 7 hari terakhir anda makan buah dan sayur?	0	1	2	3	4	5	6	7
3. Berapa hari dalam 7 hari terakhir anda mengkonsumsi makanan berlemak tinggi (daging sapi/kambing/babi/makanan cepat saji) atau produk olahan susu (keju, cream, yoghurt dan mentega)?	0	1	2	3	4	5	6	7
4. Berapa hari dalam 7 hari terakhir anda mengatur pemasukan makanan yang mengandung karbohidrat (nasi, roti, mie, jagung dan singkong)?	0	1	2	3	4	5	6	7
5. Berapa hari dalam 7 hari terakhir anda mengikuti pola makan yang sehat?	0	1	2	3	4	5	6	7
6. Berapa hari dalam 7 hari terakhir	0	1	2	3	4	5	6	7

anda makan makanan selingan/cemilan yang mengandung gula (kue, biskuit, coklat, es krim)?								
Latihan fisik								
7. Berapa hari dalam 7 hari terakhir anda melakukan aktivitas fisik (mencuci, menyapu, mengepel, menjemur atau berkebun) setidaknya selama 30 menit?	0	1	2	3	4	5	6	7
8. Berapa hari dalam 7 hari terakhir anda mengikuti sesi latihan khusus (berenang, berjalan dan bersepeda) selain dari apa yang anda lakukan di sekitar rumah atau apa yang menjadi bagian dari pekerjaan anda?	0	1	2	3	4	5	6	7
Perawatan kaki								
9. Berapa hari dalam tujuh hari terakhir anda memeriksa kaki anda?	0	1	2	3	4	5	6	7
10. Berapa hari dalam tujuh hari terakhir anda memeriksa bagian dalam sepatu anda?	0	1	2	3	4	5	6	7
11. Berapa hari dalam tujuh hari terakhir anda mengeringkan sela-sela jari kaki setelah dicuci?	0	1	2	3	4	5	6	7
12. Berapa hari dalam tujuh hari terakhir anda menggunakan alas kaki saat keluar rumah?	0	1	2	3	4	5	6	7
13. Berapa hari dalam tujuh hari terakhir anda menggunakan pelembab atau lotion pada kaki anda	0	1	2	3	4	5	6	7
Minum obat								
14. Berapa hari dalam satu minggu terakhir anda minum obat diabetes yang disarankan untuk anda?	0	1	2	3	4	5	6	7
15. Apakah anda menggunakan insulin? Jika ya, berapa hari dalam tujuh hari?	0	1	2	3	4	5	6	7
Monitoring gula darah								
16. Berapa hari dalam tujuh hari terakhir anda mengecek gula darah anda sesuai dengan waktu yang disarankan oleh tenaga	0	1	2	3	4	5	6	7

kesehatan anda? (Yang menggunakan insulin)								
17. a. Jika anda menggunakan insulin, berapa hari dalam tujuh hari terakhir anda mengecek gula darah anda? b. Jika anda tidak menggunakan insulin. Dalam tiga bulan terakhir berapa kali anda mengecek gula darah secara rutin?	0	1	2	3	4	5	6	7

Lampiran 3. Rekomendasi Persetujuan Etik



KEMENTERIAN PENDIDIKAN, KEBUDAYAAN
RISET, DAN TEKNOLOGI
UNIVERSITAS HASANUDDIN
FAKULTAS KESEHATAN MASYARAKAT
Jln. Perintis Kemerdekaan Km.10 Makassar 90245, Telp.(0411) 585658,
E-mail : fk.m.unhas@gmail.com, website: <https://fk.m.unhas.ac.id/>

REKOMENDASI PERSETUJUAN ETIK

Nomor: 6393/UN4.14.1/TP.01.02/2023

Tanggal: 12 Desember 2023

Dengan ini Menyatakan bahwa Protokol dan Dokumen yang Berhubungan dengan Protokol berikut ini telah mendapatkan Persetujuan Etik:

No. Protokol	41223032275	No. Sponsor Protokol	
Peneliti Utama	Gladis A. Ismail	Sponsor	Pribadi
Judul Peneliti	Analisis Determinan Komplikasi Pada Pasien Diabetes Mellitus Tipe 2 di Rumah Sakit Aloe'i Saboe Kota Gorontalo		
No. Versi Protokol	1	Tanggal Versi	4 Desember 2023
No. Versi PSP	1	Tanggal Versi	4 Desember 2023
Tempat Penelitian	Rumah Sakit Aloe'i Saboe Kota Gorontalo		
Judul Review	<input type="checkbox"/> Exempted <input checked="" type="checkbox"/> Expedited <input type="checkbox"/> Fullboard	Masa Berlaku 12 Desember 2023 Sampai 12 Desember 2024	Frekuensi review lanjutan
Ketua Komisi Etik Penelitian	Nama: Prof. dr. Veni Hadju, M.Sc, Ph.D	Tanda tangan	Tanggal 12 Desember 2023
Sekretaris komisi Etik Penelitian	Nama: Dr. Wahiduddin, SKM., M.Kes	Tanda tangan	Tanggal 12 Desember 2023

Kewajiban Peneliti Utama :

1. Menyerahkan Amandemen Protokol untuk persetujuan sebelum di implementasikan
2. Menyerahkan Laporan SAE ke Komisi Etik dalam 24 Jam dan dilengkapi dalam 7 hari dan Laporan SUSAR dalam 72 Jam setelah Peneliti Utama menerima laporan
3. Menyerahkan Laporan Kemajuan (progress report) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah
4. Menyerahkan laporan akhir setelah Penelitian berakhir
5. Melaporkan penyimpangan dari protocol yang disetujui (protocol deviation/violation)
6. Mematuhi semua peraturan yang ditentukan

Lampiran 4. Surat Permohonan Izin Penelitian dari Fakultas



KEMENTERIAN PENDIDIKAN KEBUDAYAAN,
RISET DAN TEKNOLOGI
UNIVERSITAS HASANUDDIN
FAKULTAS KESEHATAN MASYARAKAT
Jl. Perintis Kemerdekaan Km.10 Makassar 90245, Telp.(0411) 585658,
e-mail : fkm.unhas@gmail.com, website: https://fkm.unhas.ac.id/

Nomor : 27876/UN4.14.1/PT.01.04/2023
Lamp. : ---
Hal : Permohonan Izin Penelitian

Yth. : **Direktur RSUD Prof. Dr. Aloi Saboe Kota Gorontalo**
Di
Tempat

Dengan hormat, kami sampaikan bahwa mahasiswa Program Pascasarjana Fakultas Kesehatan Masyarakat Universitas Hasanuddin yang tersebut di bawah ini :

Nama : Gladis A. Ismail
Nomor Pokok : K012221023
Program Studi : S2 Ilmu Kesehatan Masyarakat

Bermaksud melakukan penelitian dalam rangka persiapan penulisan tesis dengan judul "Analisis Determinan Komplikasi Pada Pasien Diabetes Mellitus Tipe 2 Di Rumah Sakit Aloe Saboe Kota Gorontalo"

Pembimbing Utama : Prof. Dr. Nur Nasry Noor, MPH
Pembimbing Pendamping : Prof. Dr. drg. Andi Zulkifli, M.Kes

Waktu Penelitian : Desember 2023 - Februari 2024

Sehubungan dengan hal tersebut kami mohon kebijaksanaan Bapak/Ibu kiranya berkenan memberi izin kepada yang bersangkutan.

Atas perhatian dan kerjasamanya, disampaikan terima kasih.

Makassar, 18 Desember 2023

an. Dekan.

Wakil Dekan Bidang Akademik dan Kemahasiswaan,



Dr. Wahiduddin, SKM.,M.Kes.
NIP 197604072005011004

Tembusan Yth.:

1. Dekan Fakultas Kesehatan Masyarakat Unhas;
2. Arsip.

Lampiran 5. Izin Penelitian dari Kesbangpol



PEMERINTAH KOTA GORONTALO
BADAN KESATUAN BANGSA DAN POLITIK

Jln. Bali Kel. Pulubala Telp. (0435) 821003 Email : kesbangpolkotagorontalo@yahoo.co.id

SURAT KETERANGAN ADVIS
NOMOR : 070/KesbangPol/1768

Berdasarkan Surat Permohonan dari Dekan Bidang Akademik dan Kemahasiswaan Fakultas Kesehatan Masyarakat Universitas Hasanudin Nomor : 28876/UN4.14.1/PT.01.04/2023 Tanggal 18 Desember 2023 Perihal Permohonan Rekomendasi Penelitian, setelah dilakukan pemeriksaan berkas yang diajukan sebagai dasar Penerbitan Advis serta mengacu pada ketentuan Perundang-Undangan yang berlaku maka Advis teknis diberikan kepada :

Nama : Gladis A. Ismail
No. Pokok : K012221023
Program Studi : S2 Ilmu Kesehatan Masyarakat
Judul Penelitian : **“Analisis Determinan Komplikasi Pada Pasien Diabetes Mellitus Tipe 2 Di Rumah Sakit Aloe Saboe Kota Gorontalo”.**

Demikian Surat Keterangan Advis ini dibuat dan diberikan untuk dipergunakan sebagaimana mestinya, atas kerjasamanya diucapkan terima kasih.

Gorontalo, 21 Desember 2023
A.n.KEPALA BADAN
PEJABAT FUNGSIONAL AHLI MUDA
ANALIS KEBIJAKAN PUBLIK


SAMRIN PAKAJA, SE
PENATA Tkt.I
NIP. 19710201 200604 1 017

Tembusan :

1. Walikota Gorontalo
2. Kepala DPMPPTSP Kota Gorontalo

7. Izin Penelitian dari Rumah Sakit Aloe Saboe



PEMERINTAH KOTA GORONTALO
RUMAH SAKIT UMUM DAERAH PROF. DR. H. ALOEI SABOE
Jalan Prof. Dr. H. Aloe Saboe Kel. Wongkaditi Timur Kec. Kota Utara

SURAT KETERANGAN

No : 440/RSU-IP/PEL/2024

Direktur Rumah Sakit Umum Daerah Prof. Dr. H. Aloe Saboe Kota
Gorontalo, dengan ini menerangkan kepada :

N a m a : **GLADIS A ISMAIL**
NIM : K012221023
Pekerjaan : Mahasiswa Universitas Hasanudin Makassar

Bahwa yang bersangkutan benar-benar telah selesai melaksanakan
Penelitian dengan Judul "**Analisis Determinan Komplikasi Pada Pasien
Diabetes Militus Tipe II di Rumah Sakit Aloe Saboe**"

Demikian Surat Keterangan ini dibuat untuk dipergunakan seperlunya.

Gorontalo, 17 Juli 2024

Pt.DIREKTUR

DR. MUHAMMAD KASIM, M.Sc.Apt
NIP. 19690406 199903 1 007

Lampiran 8. Dokumentasi Kegiatan Penelitian



Lampiran 9. Analisis Data

Analisis Univariat

Alamat (Kec)	Apakah Komplikasi		Total
	Tidak	Ya	
Sipatana	24 31.17	3 3.90	27 17.53
Kota Utara	14 18.18	14 18.18	28 18.18
Kota Tengah	7 9.09	9 11.69	16 10.39
Dungingi	4 5.19	4 5.19	8 5.19
Kota Selatan	7 9.09	16 20.78	23 14.94
Kota Timur	7 9.09	22 28.57	29 18.83
Hulonthalangi	6 7.79	2 2.60	8 5.19
Dumbo Raya	8 10.39	1 1.30	9 5.84
Kota Barat	0 0.00	6 7.79	6 3.90
Total	77 100.00	77 100.00	154 100.00

RECODE of UmurTahun (Umur (Tahun))	Apakah Komplikasi		Total
	Tidak	Ya	
25-34	7 9.09	1 1.30	8 5.19
35-44	11 14.29	5 6.49	16 10.39
45-54	30 38.96	11 14.29	41 26.62
55-64	22 28.57	34 44.16	56 36.36
≥65	7 9.09	26 33.77	33 21.43
Total	77 100.00	77 100.00	154 100.00

Key
<i>frequency</i> <i>column percentage</i>

JK	Apakah Komplikasi		Total
	Tidak	Ya	
Perempuan	40 51.95	40 51.95	80 51.95
Laki-laki	37 48.05	37 48.05	74 48.05
Total	77 100.00	77 100.00	154 100.00

. tab Pendidikan ApakahKomplikasi, col

Key
<i>frequency</i> <i>column percentage</i>

Pendidikan	Apakah Komplikasi		Total
	Tidak	Ya	
Tidak Sekolah	1 1.30	1 1.30	2 1.30
SD	17 22.08	26 33.77	43 27.92
SMP	14 18.18	20 25.97	34 22.08
SMA	21 27.27	20 25.97	41 26.62
D3/S1/S2/S3	24 31.17	10 12.99	34 22.08
Total	77 100.00	77 100.00	154 100.00

. tab Pekerjaan ApakahKomplikasi, col

Key
<i>frequency</i> <i>column percentage</i>

Pekerjaan	Apakah Komplikasi		Total
	Tidak	Ya	
Sopir	3 3.90	3 3.90	6 3.90
Petani	25 32.47	6 7.79	31 20.13
Wiraswasta	10 12.99	22 28.57	32 20.78
PNS/ABRI/Honoror	11 14.29	2 2.60	13 8.44
Pensiun	5 6.49	10 12.99	15 9.74
Pegawai Swasta	1 1.30	3 3.90	4 2.60
IRT	22 28.57	31 40.26	53 34.42
Total	77 100.00	77 100.00	154 100.00

. tab LamaMenderita ApakahKomplikasi, col

Key
<i>frequency</i> <i>column percentage</i>

Lama Menderita	Apakah Komplikasi		Total
	Tidak	Ya	
<5 tahun	44 57.14	29 37.66	73 47.40
5-10 tahun	33 42.86	48 62.34	81 52.60
Total	77 100.00	77 100.00	154 100.00

. tab IMT ApakahKomplikasi, col

Key
<i>frequency</i> <i>column percentage</i>

IMT	Apakah Komplikasi		Total
	Tidak	Ya	
<25 kg/m ²	43 55.84	40 51.95	83 53.90
≥25 kg/m ²	34 44.16	37 48.05	71 46.10
Total	77 100.00	77 100.00	154 100.00

. tab AktifitasFisik ApakahKomplikasi, col

Key
<i>frequency</i>
<i>column percentage</i>

Aktifitas Fisik	Apakah Komplikasi		Total
	Tidak	Ya	
≥1500 MET	51 66.23	47 61.04	98 63.64
≤1499 MET	26 33.77	30 38.96	56 36.36
Total	77 100.00	77 100.00	154 100.00

. tab KepatuhanObat ApakahKomplikasi, col

Key
<i>frequency</i>
<i>column percentage</i>

Kepatuhan Obat	Apakah Komplikasi		Total
	Tidak	Ya	
8	45 58.44	27 35.06	72 46.75
<8	32 41.56	50 64.94	82 53.25
Total	77 100.00	77 100.00	154 100.00

. tab UmurDMTahun ApakahKomplikasi, col

Key
<i>frequency</i>
<i>column percentage</i>

Umur DM (Tahun)	Apakah Komplikasi		Total
	Tidak	Ya	
15-59	55 71.43	54 70.13	109 70.78
≥60	22 28.57	23 29.87	45 29.22
Total	77 100.00	77 100.00	154 100.00

. tab SelfCareBehavior ApakahKomplikasi, col

Key
<i>frequency</i>
<i>column percentage</i>

Self Care Behavior	Apakah Komplikasi		Total
	Tidak	Ya	
≥60	46 59.74	30 38.96	76 49.35
≤59	31 40.26	47 61.04	78 50.65
Total	77 100.00	77 100.00	154 100.00

Jenis Komplikasi	Freq.	Percent	Cum.
Retinopati	20	25.97	25.97
Neuropati	26	33.77	59.74
Nefropati	14	18.18	77.92
PJK	1	1.30	79.22
Stroke	4	5.19	84.42
Hipertensi	12	15.58	100.00
Total	77	100.00	

Analisis Bivariat

. cc ApakahKomplikasi LamaMenderita

	Exposed	Unexposed	Total	Proportion Exposed
Cases	48	29	77	0.6234
Controls	33	44	77	0.4286
Total	81	73	154	0.5260
	Point estimate		[95% Conf. Interval]	
Odds ratio	2.206897		1.102604	4.430416 (exact)
Attr. frac. ex.	.546875		.093056	.7742876 (exact)
Attr. frac. pop	.3409091			

chi2(1) = 5.86 Pr>chi2 = 0.0155

. cc ApakahKomplikasi IMT

	Exposed	Unexposed	Total	Proportion Exposed
Cases	37	40	77	0.4805
Controls	34	43	77	0.4416
Total	71	83	154	0.4610
	Point estimate		[95% Conf. Interval]	
Odds ratio	1.169853		.591147	2.316562 (exact)
Attr. frac. ex.	.1451917		-.6916265	.5683257 (exact)
Attr. frac. pop	.0697674			

chi2(1) = 0.24 Pr>chi2 = 0.6277

. cc ApakahKomplikasi AktifitasFisik

	Exposed	Unexposed	Total	Proportion Exposed
Cases	30	47	77	0.3896
Controls	26	51	77	0.3377
Total	56	98	154	0.3636
	Point estimate		[95% Conf. Interval]	
Odds ratio	1.252046		.6158136	2.550421 (exact)
Attr. frac. ex.	.2013072		-.6238681	.6079079 (exact)
Attr. frac. pop	.0784314			

chi2(1) = 0.45 Pr>chi2 = 0.5028

. cc ApakahKomplikasi KepatuhanObat

	Exposed	Unexposed	Total	Proportion Exposed
Cases	50	27	77	0.6494
Controls	32	45	77	0.4156
Total	82	72	154	0.5325
	Point estimate		[95% Conf. Interval]	
Odds ratio	2.604167		1.292083	5.268669 (exact)
Attr. frac. ex.	.616		.2260557	.8101987 (exact)
Attr. frac. pop	.4			

chi2(1) = 8.45 Pr>chi2 = 0.0036

```
. cc ApakahKomplikasi UmurDMTahun
```

	Exposed	Unexposed	Total	Proportion Exposed
Cases	23	54	77	0.2987
Controls	22	55	77	0.2857
Total	45	109	154	0.2922
	Point estimate		[95% Conf. Interval]	
Odds ratio	1.064815		.5013536	2.263644 (exact)
Attr. frac. ex.	.0608696		-.9946003	.5582344 (exact)
Attr. frac. pop	.0181818			

```
chi2(1) = 0.03 Pr>chi2 = 0.8594
```

```
. cc ApakahKomplikasi SelfCareBehavior
```

	Exposed	Unexposed	Total	Proportion Exposed
Cases	47	30	77	0.6104
Controls	31	46	77	0.4026
Total	78	76	154	0.5065
	Point estimate		[95% Conf. Interval]	
Odds ratio	2.324731		1.160506	4.671171 (exact)
Attr. frac. ex.	.5698427		.1383068	.7859209 (exact)
Attr. frac. pop	.3478261			

```
chi2(1) = 6.65 Pr>chi2 = 0.0099
```

Analisis Multivariat

```
. logistic ApakahKomplikasi LamaMenderita KepatuhanObat SelfCareBehavior
```

```
Logistic regression          Number of obs   =      154
                             LR chi2(3)           =      40.88
                             Prob > chi2          =      0.0000
Log likelihood = -86.30596    Pseudo R2       =      0.1915
```

ApakahKomplikasi	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
LamaMenderita	8.440416	4.149288	4.34	0.000	3.22044 22.12139
KepatuhanObat	4.70299	1.840042	3.96	0.000	2.184449 10.12526
SelfCareBehavior	8.114203	3.941421	4.31	0.000	3.131702 21.02381
_cons	.0522334	.0296893	-5.19	0.000	.0171446 .1591361

```
. logit ApakahKomplikasi LamaMenderita KepatuhanObat SelfCareBehavior
```

```
Iteration 0: log likelihood = -106.74467
Iteration 1: log likelihood = -86.470807
Iteration 2: log likelihood = -86.306152
Iteration 3: log likelihood = -86.30596
Iteration 4: log likelihood = -86.30596
```

```
Logistic regression          Number of obs   =      154
                             LR chi2(3)           =      40.88
                             Prob > chi2          =      0.0000
Log likelihood = -86.30596    Pseudo R2       =      0.1915
```

ApakahKomplikasi	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
LamaMenderita	2.133032	.4915976	4.34	0.000	1.169518 3.096545
KepatuhanObat	1.548198	.3912494	3.96	0.000	.7813636 2.315033
SelfCareBehavior	2.093616	.4857434	4.31	0.000	1.141576 3.045656
_cons	-2.952033	.5683969	-5.19	0.000	-4.066071 -1.837996

Komponen *Self Care Behavior*

. tab SCB1 ApakahKomp, col

Key
<i>frequency</i> <i>column percentage</i>

SCB1	Apakah Komp		Total
	Ya	Tidak	
Buruk	43 55.84	26 33.77	69 44.81
Baik	34 44.16	51 66.23	85 55.19
Total	77 100.00	77 100.00	154 100.00

. tab SCB2 ApakahKomp, col

Key
<i>frequency</i> <i>column percentage</i>

SCB2	Apakah Komp		Total
	Ya	Tidak	
Buruk	30 38.96	26 33.77	56 36.36
Baik	47 61.04	51 66.23	98 63.64
Total	77 100.00	77 100.00	154 100.00

. tab SCB3 ApakahKomp, col

Key
<i>frequency</i> <i>column percentage</i>

SCB3	Apakah Komp		Total
	Ya	Tidak	
Buruk	55 71.43	41 53.25	96 62.34
Baik	22 28.57	36 46.75	58 37.66
Total	77 100.00	77 100.00	154 100.00

. tab SCB4 ApakahKomp, col

Key
<i>frequency</i> <i>column percentage</i>

SCB4	Apakah Komp		Total
	Ya	Tidak	
Buruk	50 64.94	32 41.56	82 53.25
Baik	27 35.06	45 58.44	72 46.75
Total	77 100.00	77 100.00	154 100.00

. tab SCB5 ApakahKomp, col

Key
<i>frequency</i> <i>column percentage</i>

SCB5	Apakah Komp		Total
	Ya	Tidak	
Buruk	41 53.25	28 36.36	69 44.81
Baik	36 46.75	49 63.64	85 55.19
Total	77 100.00	77 100.00	154 100.00

.

Lampiran 10. Riwayat Hidup

RIWAYAT HIDUP



A. Data Pribadi

Nama : Gladis A. Ismail
 Tempat/Tgl Lahir : Gorontalo, 26 Januari 1999
 Jenis Kelamin : Perempuan
 Agama : Islam
 Alamat : Jln Dulamayo, Desa Tupa
 Kec. Bulango Utara, Kab. Bone Bolango
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D. Riwayat Penelitian

1. Hubungan Berat Badan Lebih (*Overweight*) dengan Kejadian Diabetes Mellitus Tipe 2 di Wilayah Kerja Puskesmas Bulango Utara

ANALYSIS OF DETERMINANTS OF COMPLICATIONS IN TYPE 2 DIABETES MELLITUS AT ALOEI SABOE HOSPITAL, GORONTALO CITY

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Abstract

Context/Background: Based on the 2018 Basic Health Research (Riskesdas) of the Indonesian Ministry of Health regarding Diabetes Mellitus, the national prevalence of DM is 2% and the prevalence rate of DM in Gorontalo Province is above the national average of 2.60%. **Aims/Objectives:** This study aims to analyse the determinants that are risk factors for complications of Type 2 Diabetes Mellitus. **Methodology:** This research uses a case control study design with a total sample size of 154 consisting of 77 cases and 77 controls selected by systematic random sampling method. Data analysis was carried out using Stat version 14 program. **Results:** The results showed that the determinants that became risk factors for complications in patients with type 2 diabetes mellitus were length of suffering (OR=2.206; 95%CI = 1.102- 4.430), drug compliance (OR=2.604; 95%CI = 1.292-5.268) and self-care behaviour (OR=2.324; 95%CI = 1.160- 4.671). The results of logistic regression analysis showed that length of suffering was the main determinant of the incidence of complications in patients with type 2 diabetes mellitus. **Conclusions:** Increased health promotion, especially related to the determinants of DM complications, is needed to reduce the incidence of DM complications.

Keywords: Determinants, Complications, Diabetes Mellitus Type 2.

INTRODUCTION

Non-communicable diseases are an important cause of premature death and disability. One of the non-communicable diseases is Diabetes Mellitus[1]. Diabetes mellitus (DM) is a chronic metabolic disorder characterised by high blood sugar levels (hyperglycaemia) which will result in impaired insulin secretion and insulin resistance[2].

Diabetes mellitus is a national and global health concern today. According to the World Health Organisation (2023) there are approximately 422 million people worldwide with diabetes, the majority living in low- and middle-income countries[3]. In 2021 the International Diabetes Federation (IDF) recorded 537 million adults (aged 20 - 79 years) or 1 in 10 people living with diabetes worldwide and Indonesia is in fifth position with 19.47 million people with diabetes[4]. Based on RISKESDAS data, the prevalence of DM was 1.5% in 2013 and increased to 2% in 2018[5].

Based on the Basic Health Research (Riskesdas) of the Indonesian Ministry of Health in 2018 regarding Diabetes Mellitus, it shows that the prevalence of DM sufferers in Gorontalo Province is 2.4%, where the prevalence rate is higher when compared to the national prevalence rate according to Riskesdas in 2018 which is only 2.0% [5]. Data obtained from the Gorontalo Provincial Health Office in the last 3 years, namely in 2020 the prevalence of Diabetes Mellitus was 0.49%, in 2021 the prevalence of

Diabetes Mellitus was 2.03% and in 2022 the prevalence of Diabetes Mellitus was 2.60%[6].

A multicentre study conducted in China and Micronesia, which collected data from outpatients found that the prevalence of chronic complications of Type 2 Diabetes Mellitus is very high consisting of 33.4% with macrovascular complications and 34.7% having microvascular complications. This occurs due to poor glycaemic control and failure to achieve treatment goals especially in the outpatient setting which is prone to having low therapy adherence and inadequate monitoring[7]. The incidence of chronic complications can increase if not able to control risk factors such as age, gender, duration of illness, drug consumption, and BMI[8].

Considering the adverse effects that occur if DM patients cannot control blood sugar properly will risk complications, the determinants of the incidence of complications in type 2 DM patients need to be known. The results of this study are expected to be taken into consideration in determining activity programmes and policies in the context of preventing and managing diabetes mellitus.

Objectives:

This study aims to analyse the determinants that are risk factors for complications of Type 2 Diabetes Mellitus at Aloe Saboe Hospital, Gorontalo City,

METHODOLOGY

Study Design

This study was conducted in Gorontalo City. This study used a case management study design to determine the determinants that are risk factors for complications in patients with type 2 diabetes mellitus.

Population and Sample

The population in this study were Type 2 Diabetes Mellitus patients registered as inpatients at Aloe Saboe Hospital, Gorontalo City in 2022 as many as 484 people. As for patients affected by type 2 DM complications, there were 245 people. A total of 154 respondents met the criteria to participate in this study. The sample was divided into 2 groups, namely case and control groups with a ratio of 1: 1.

Research Variable

The dependent variable is the incidence of complications. The independent variables consisted of length of stay, body mass index, physical activity, medication compliance, age and self-care behaviour.

Data Collection

Data collection was conducted through the interview method by visiting each respondent's home. Researchers took about 15-20 minutes to interview each respondent. The measuring instrument used at the time of data collection was a questionnaire.

Data Analysis

Data were processed using Stata version 14 program. The association and magnitude of risk factors between dependent and independent variables were analysed with the

chi-square test. The multivariate analysis used was the logistic regression test with a confidence level of 95% ($\alpha = 0.05$).

Ethical Approval

This study was approved by the Health Research Ethics Committee of Hasanuddin University with ethical approval recommendation number 6393/UN4.14.1/TP.01.02/2023. Informed consent was obtained from all research respondents, data confidentiality was maintained and privacy was guaranteed.

RESULTS

Table 1: Distribution of Respondents Based on Characteristics

Respondent Characteristics	Frequency (n)	Percentages (%)
Address (District)		
Sipatana	27	17,53
Northern city	28	18,18
Centre city	16	10,39
Dungingi	8	5,19
Southern city	23	14,94
East city	29	18,83
Hulonthalangi	8	5,19
Dumbo Raya	9	5,84
Western city	6	3,90
Age (Years old)		
25-34	8	5,19
35-44	16	10,39
45-54	41	26,62
55-64	56	36,36
≥65	33	21,43
Gender		
Female	80	51,95
Male	74	48,05
Education		
Not in school/Not completed primary school	2	1,30
Completed primary school	43	27,92
Completed secondary	34	22,08
Completed tertiary	41	26,62
Completed diploma/bachelor's degree/master's degree	34	22,08
Occupation		
Driver	6	3,90
Farmer	31	20,13
Self-employed	32	20,78
Civil servants/Military/Honorary	13	8,44
Retired	15	9,74
Private employee	4	2,60
Housewife	53	34,42
Total	154	100

Table 1 shows that 29 respondents (18.83%) resided in the eastern city sub-district and 56 people (36.36%) of them were in the age group of 55-64 years. Most of the respondents were female 80 (51.95%), and 43 people (27.92%) had the last level of education, namely elementary school graduates. Then as many as 53 people (34.42%) who work as housewives.

Table 2: Distribution of Respondents by Complication Type

Types of Complications	Number of Respondents (n=77)	
	Frequency (n)	Percentages (%)
Retinopathy	20	25,97
Neuropathy	26	33,77
Nefropathy	14	18,18
CHD	1	1,30
Stroke	4	5,19
Hypertension	12	15,58
Total	77	100

Table 2 shows that the most common type of complication suffered by respondents was neuropathy, with 26 cases (33.77%), while the least common type of complication suffered was coronary heart disease, with 1 case (1.30%).

Table 3: Bivariate Analysis of the Incidence of Complications

Determinants of Complications	Case		Control		OR	CI 95% LL-UL
	n	%	n	%		
Lama Menderita						
5-10 years	48	62,34	33	42,86	2,206	1,102-4,430
<5 years	29	37,66	44	57,14		
Body Mass Index (BMI)						
≥25 kg/m ²	37	48,05	34	44,16	1,169	0,591-2,316
<25 kg/m ²	40	51,95	43	55,84		
Physical Activity						
≤1499 METS	30	38,96	26	33,77	1,252	0,615-2,550
≥1500 METS	47	61,04	51	66,23		
Medication Adherence						
Score <8	50	64,94	32	41,56	2,604	1,292-5,268
Score 8	27	35,06	45	58,44		
Age						
≥60 years old	23	29,87	22	28,57	1,064	0,501-2,263
15-59 years old	54	70,13	55	71,43		
Self Care Behavior						
≤59	47	61,04	31	40,26	2,324	1,160-4,671
≥60	30	38,96	46	59,74		
Total	77	100	77	100		

Table 3 shows that based on the determinants of complications, length of illness, medication compliance and self-care behaviour are significant risk factors for the incidence of complications with an OR of 2.206 and 95% CI 1.102-4.430 for the determinant of length of illness, OR of 2.604 and 95% CI 1.292-5.268 for the determinant of medication compliance and OR of 2.324 and 95% CI 1.160-4.671 for the determinant of self-care behaviour. The analysis also found that body mass index, physical activity and age were not significant risk factors for the incidence of complications with an OR of 1.169 and 95% CI 0.591-2.316 for BMI determinants, OR of 1.252 and 95% CI 0.615-2.550 for physical activity determinants and OR of 1.064 and 95% CI 0.501-2.263 for age determinants.

Table 4: Logistic Regression Analysis of Determinants of Complications Incidence

Variable	p-value	OR	CI 95%	
			LL	UL
Long suffering	0,000	8,440	3,220	22,121
Medication adherence	0,000	4,702	2,184	10,125
Self-care behavior	0,000	8,114	3,131	21,023

Table 4 shows the results of multivariate logistic regression analysis. Each independent variable that shows a p-value <0.25 in the bivariate analysis can be included in the multivariate analysis. In this multivariate analysis, it was found that length of stay, medication adherence and self-care behaviour were associated with the incidence of complications in patients with type 2 diabetes mellitus. Based on the OR value, it shows that the duration of suffering is the main determinant of the incidence of complications in patients with type 2 diabetes mellitus with OR 8.440 and 95% CI value 3.220-22.121. This shows that patients with type 2 diabetes mellitus who have a long history of suffering from DM 5-10 years have a risk of 8.440 times to experience complications compared to patients with DM who have a long history of suffering <5 years.

DISCUSSION

Long Suffering

The results showed that length of suffering was a significant risk factor for the incidence of complications. Based on the results of multivariate analysis, it was found that the length of suffering was a risk factor that became the main determinant of the incidence of complications in patients with type 2 diabetes mellitus.

This study is in line with research conducted by Purwandari et al which shows that every increase in the length of suffering by 1 year will increase the risk of chronic complications of Diabetes Mellitus Type 2 by 2.274 times [9]. However, based on the research of Kusdiyah et al showed different results that there was no significant relationship between the length of suffering with the incidence of DM complications [10].

Diabetes mellitus causes complications that end in death. Disease duration is associated with subjective complaints. The severity is seen from the length of the disease, the risk of subjective complaints can increase with the duration of DM disease. If subjective complaints are not controlled or the cause is unknown, they can lead to complications [11].

Body mass index

Based on the results of the analysis, it was found that BMI is a risk factor that is not significant for the incidence of complications in patients with type 2 DM. This is because the average IMT results of respondents are normal so that most respondents are at IMT <25 kg/m².

The same research results were found by Han et al that there was no significant relationship between body mass index and diabetic retinopathy [12]. However, different results were shown in a study conducted by Fortuna et al who found that the p-value of Body Mass Index (BMI) <0.05 so it can be concluded that BMI can be a factor affecting the incidence of complications in patients with diabetes mellitus [13].

Obesity is not just about being overweight. High levels of fat overload the body's bones and internal organs and risk causing blockages in blood vessels that can lead to disease. In the long run, this condition increases the risk of various chronic complications [14]. In obese people, there are excessive calories because the consumption of large amounts of food causes the accumulation of fat tissue under the skin. Insulin resistance or insulin resistance will arise, where the accumulated fat tissue will inhibit the work of insulin in the body's tissues and muscles so that sugar cannot be transported into cells and accumulate in blood vessels [14].

Physical activity

The results showed that most of the respondents whose physical activity ≥ 1500 MET experienced complications. Therefore, physical activity is a risk factor that is not significant for the incidence of complications in patients with type 2 diabetes.

This finding is in line with research conducted by Purwandari et al and shows that the value ($p > 0.05$) means that there is no relationship between physical activity and the incidence of complications of type 2 DM [9]. In contrast to the research of Badrujamaludin et al who found that there was a relationship between physical activity and the incidence of neuropathy in patients with type 2 DM [15].

Exercise is a physical activity that is very beneficial for improving blood circulation, losing weight and improving sensitivity to insulin, so that it will improve blood glucose levels. Controlled blood glucose levels can prevent the risk of DM complications [16].

Medication adherence

Based on the results of the study, it was found that respondents with poor drug compliance had more complications. These results indicate that the level of drug compliance is a significant risk factor for the incidence of complications.

The same results were found in a study by Laksono et al which showed that people with DM who took irregular medication had a 3 times greater risk of developing complications than people with DM who took regular medication [17]. Another case with research conducted by Rasdianah et al shows the results that there is no relationship between compliance with taking medication with the incidence of complications in Type 2 DM patients [18].

Diabetes mellitus is a degenerative disease that requires long-term and continuous treatment, although this treatment cannot cure the patient's disease but with regular therapy it will reduce and slow down complications that may occur. Therefore, patient compliance in taking medication plays an important role in the success of treatment [19].

Age

The results showed that age is a risk factor that is not significant for the incidence of complications in patients with type 2 DM. In this study, most respondents were in the age group of 15-59 years.

The results of this study are in line with the research of Budiman et al which showed that there was no effect of age on the incidence of diabetic ulcers [20]. However, different results were found by Hutapea et al that neuropathy complications occurred more in DM patients aged ≥ 60 years [21].

Age over 60 years is an advanced age where a person experiences a decrease in various organ functions that have the potential for various degenerative diseases including DM and its complications. This is in accordance with what Smeltzer & Bare stated that age > 60 years tends to result in increased insulin resistance. Uncontrolled increase in insulin resistance in DM patients will result in chronic hyperglycaemia which has an impact on damage to various organ systems called DM complications [22].

Self care behavior

Based on the results of the analysis, it is known that self-care behaviour is a significant risk factor for the incidence of complications in patients with type 2 diabetes. In this study, the majority of respondents had an irregular diet, foot care, blood sugar control and lack of medication compliance.

This research is in line with a study conducted by Indriani et al found that self care behaviour that is lacking has a 4 times greater chance of experiencing neuropathy complications than people who have good self care [23]. In contrast to research conducted by Sasombo et al who found that there was no relationship between self care and complications of diabetes mellitus in patients [24].

This is because diabetes self-care is an action taken by individuals to control diabetes which includes treatment and prevention of complications, so that self-care that is done well can minimise acute or chronic complications, especially by following self-care practices which include a recommended diet, self-intake which includes exercise, medicines and blood glucose monitoring [25].

CONCLUSION

There are several risk factors that determine the incidence of complications in patients with type 2 DM, including length of stay, medication compliance, and self-care behaviour. Among these risk factors, length of illness is the main determinant of complications in type 2 DM patients. Increased health promotion, especially related to the determinants of diabetes mellitus complications, is needed to reduce the incidence of complications of type 2 diabetes mellitus.

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