



**PERGURUAN TINGGI MUHAMMADIYAH
UNIVERSITAS AHMAD DAHLAN**

LEMBAGA PENELITIAN DAN PENGABDIAN KEPADA MASYARAKAT

UAD Kampus 2 Unit B, Jl. Pramuka no. 5F, Pandeyan, Umbulharjo Yogyakarta 55161, email : lppm@uad.ac.id

**SUB KONTRAK PENELITIAN TAHUN JAMAK
PENELITIAN DASAR/PENGEMBANGAN KAPASITAS
KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET, DAN TEKNOLOGI
TAHUN ANGGARAN 2021**

NOMOR: 002/SK.PJD/LPPM/VII/2021

Pada hari ini **Jumat** tanggal **Dua puluh tiga** bulan **Juli** tahun **dua ribu dua puluh satu (23-07-2021)**, kami yang bertandatangan di bawah ini:

- 1. Anton Yudhana, M.T., Ph.D.** : Kepala Lembaga Penelitian dan Pengabdian kepada Masyarakat Universitas Ahmad Dahlan (LPPM UAD) dalam hal ini bertindak untuk dan atas nama Universitas Ahmad Dahlan, yang berkedudukan di Jalan Gondosuli no. 1B Yogyakarta, untuk selanjutnya disebut **PIHAK PERTAMA**;
- 2. SOLIKHAH** : Dosen/Peneliti Program Studi Kesehatan Masyarakat Universitas Ahmad Dahlan, dalam hal ini bertindak sebagai Ketua Pelaksana Penelitian sumberdana DRPM Kemendikbud Ristek Tahun Anggaran 2020 untuk selanjutnya disebut **PIHAK KEDUA**.

PIHAK PERTAMA dan **PIHAK KEDUA**, secara bersama-sama sepakat mengikatkan diri dalam Sub Kontrak Penelitian (SKP) Penelitian Dasar dan Pengembangan/Kapasitas Sumberdana Kemendikbud Ristek Tahun Anggaran 2021 dengan ketentuan dan syarat-syarat sebagai berikut.

Pasal 1

DASAR HUKUM

Kontrak penelitian ini didasarkan pada:

- Keputusan Kuasa Pengguna Anggaran Deputi Bidang Penguatan Riset dan Pengembangan Kementerian Riset dan Teknologi/Badan Riset dan Inovasi Nasional Nomor: 9/E1/KPT/2021 tanggal 01 Februari 2021 tentang Penetapan Pendanaan Penelitian di Perguruan Tinggi Tahun Anggaran 2021;
- Kontrak Penelitian Tahun Jamak Penelitian Dasar dan Pembinaan/Kapasitas Tahun Anggaran 2021 antara Direktorat Riset dan Pengabdian Masyarakat dengan LLDIKTI Wilayah V Nomor 165/SP2H/LT/DRPM/2021 tanggal 18 Maret 2021;
- Kontrak Penelitian Tahun Jamak Penelitian Dasar dan Pembinaan/Kapasitas Tahun Anggaran 2021 antara Direktorat Sumber Daya Direktorat Jenderal Pendidikan Tinggi dengan LLDIKTI Wilayah V Nomor 165/E4.1/AK.04.PT/2021 tanggal 12 Juli 2021;
- Kontrak Penelitian Tahun Anggaran 2020 antara LLDIKTI Wilayah V DIY dengan Universitas Ahmad Dahlan Nomor: 3279.6/LL5/PG/2021 tanggal 22 Juli 2021.

Pasal 2

RUANG LINGKUP

- PIHAK PERTAMA** memberi pekerjaan kepada **PIHAK KEDUA** dan **PIHAK KEDUA** menerima tugas tersebut dari **PIHAK PERTAMA** berupa pekerjaan penelitian pada skema Penelitian Dasar (PD) tahun ke-1 dari 2 tahun penelitian.
- Judul penelitian sebagaimana dimaksud pada ayat (1) di atas adalah: **“Model pengembangan instrumen dan uji psychometric properties instrumen kualitas hidup kanker payudara dan kanker servik di era pandemi covid-19”**



Pasal 3

Personalia Pelaksana Penelitian

Personalia pelaksana penelitian ini terdiri dari:

Ketua Peneliti : SOLIKHAH
Anggota Peneliti 1 : DYAH ARYANI PERWITASARI
Anggota Peneliti 2 : -

Pasal 4

JANGKA WAKTU PENELITIAN

Jangka waktu pelaksanaan penelitian sebagaimana dimaksud Pasal 1 dihitung sejak subkontrak ini ditandatangani dan berakhir pada tanggal **16 November 2021**.

Pasal 5

KEWAJIBAN DAN HAK

(1) **PIHAK PERTAMA** berkewajiban untuk:

- a. menyalurkan pendanaan penelitian kepada PIHAK KEDUA;
- b. melakukan pemantauan dan evaluasi terhadap pengunggahan: (i) revisi proposal; (ii) laporan kemajuan; (iii) dan/atau laporan akhir; (iv) dan/atau luaran penelitian;

(2) **PIHAK KEDUA** berkewajiban untuk mengunggah ke laman SIMLITABMAS dokumen sebagai berikut:

- a. revisi proposal penelitian
- b. surat pernyataan kesanggupan penyusunan laporan penelitian;
- c. catatan harian pelaksanaan penelitian;
- d. laporan kemajuan pelaksanaan penelitian;
- e. Surat Pernyataan Tanggungjawab Belanja (SPTB) atas dana penelitian yang telah ditetapkan;
- f. laporan akhir penelitian (dilaporkan pada tahun terakhir pelaksanaan penelitian); dan
- g. luaran penelitian.

Batas akhir unggah laporan akhir pada tanggal **16 November 2021**.

(3) **PIHAK KEDUA** berkewajiban menyampaikan pelaporan kepada LLDIKTI V DIY dengan mengunggah salinan dokumen sebagaimana dimaksud pada ayat (2) ke *Google Form* melalui tautan <http://ringkas.kemdikbud.go.id/LaporPenelitian2021> selambat-lambatnya **3 (tiga) hari** dihitung sejak batas akhir pengunggahan laporan kemajuan dan/atau laporan akhir di laman SIMLITABMAS.

(4) **PIHAK KEDUA** berhak menerima dana penelitian sesuai ketentuan dalam kontrak penelitian ini.

Pasal 6

CARA PEMBAYARAN

(1) Biaya pokok penelitian ini sebesar Rp **614,000,000,00** (Enam Ratus Empat Belas Juta rupiah) dan biaya luaran tambahan sebesar Rp 0,00 (Nol rupiah) yang pendanaannya bersumber pada DIPA Deputy Bidang Penguatan Riset dan Pengembangan Kemdikbud Ristek.

(2) **PIHAK PERTAMA** membayarkan biaya penelitian kepada **PIHAK KEDUA** dengan ketentuan sebagai berikut.

- a. Pembayaran **Tahun Pertama (2021)** sebesar Rp **307,000,000,00** (Tiga Ratus Tujuh Juta rupiah).



- b. Pembayaran **Tahun Kedua (2022)** sebesar **Rp 307,000,000,00** (Tiga Ratus Tujuh Juta rupiah).
- c. Pembayaran **Tahun Ketiga (2023)** sebesar **Rp 0,00** (Nol rupiah).
- (3) Dana penelitian sebagaimana dimaksud pada ayat (1) dibayarkan oleh **PIHAK PERTAMA** kepada **PIHAK KEDUA** ke rekening atas nama **PIHAK KEDUA**.
 - Nama Pemegang Rekening : SOLIKHAH
 - Nama Bank : BPD DIY SYARIAH
 - Nomor Rekening : 801211007578
- (4) Pendanaan penelitian sebagaimana dimaksud pada ayat (2) dapat dibayarkan apabila **PIHAK KEDUA** telah memenuhi kewajiban-kewajibannya sebagaimana dimaksud pada Pasal 5 ayat (2).

Pasal 7

PENGGANTIAN KEANGGOTAAN

- (1) Apabila **PIHAK KEDUA** tidak dapat menyelesaikan penelitian ini atau mengundurkan diri, maka **PIHAK KEDUA** wajib menunjuk pengganti Ketua Tim Pelaksana yang merupakan salah satu anggota tim pelaksana penelitian yang memenuhi persyaratan kepada Direktur DRPM Kemendikbud Ristek melalui **PIHAK PERTAMA**.
- (2) Apabila Ketua Tim Pelaksana tidak dapat melaksanakan tugas dan tidak ada pengganti ketua sebagaimana dimaksud pada ayat (1), maka **PIHAK KEDUA** harus mengembalikan dana penelitian kepada **PIHAK PERTAMA** yang selanjutnya disetor ke Kas Negara.
- (3) Bukti setor sebagaimana dimaksud pada ayat (2) diserahkan kepada **PIHAK PERTAMA** dan salinannya disimpan oleh **PIHAK KEDUA**.

Pasal 8

PAJAK DAN PELAPORAN PENGGUNAAN DANA

- (1) **PIHAK KEDUA** bertanggungjawab atas penggunaan dana penelitian yang telah diterima sesuai dengan ketentuan yang berlaku;
- (2) Hal-hal yang berkenaan dengan kewajiban pajak berupa PPN dan/atau PPh menjadi tanggungjawab **PIHAK KEDUA** dan harus dibayarkan oleh **PIHAK KEDUA** ke kantor pelayanan pajak setempat sebagai berikut:
 - (a) pembelian barang dan jasa dikenai PPN sebesar 10% dan PPh 22 sebesar 1,5%;
 - (b) pajak-pajak lain sesuai ketentuan yang berlaku.
- (2) **PIHAK KEDUA** wajib menyusun dan laporan penggunaan dana yang dilampiri dengan bukti pengeluaran yang sah termasuk bukti setor pajak dan menyimpan untuk keperluan pemeriksaan jika diminta untuk keperluan tersebut.

Pasal 9

KEKAYAAN INTELEKTUAL DAN PUBLIKASI ILMIAH

- (1) Hak atas Kekayaan Intelektual yang dihasilkan dari pelaksanaan penelitian diatur dan dikelola sesuai dengan peraturan dan perundang-undangan yang berlaku.
- (2) Setiap publikasi, makalah dan/atau ekspos dalam bentuk apapun yang berkaitan dengan hasil penelitian ini wajib mencantumkan nama pemberi dana penelitian yaitu Direktorat Riset dan Pengabdian Masyarakat, Deputi Bidang Penguatan Riset dan Pengembangan, Kementerian Pendidikan, Kebudayaan, Riset dan Teknologi.
- (3) Pencantuman nama sebagaimana dimaksud pada ayat (2), paling sedikit mencantumkan nama Kementerian Pendidikan, Kebudayaan, Riset dan Teknologi.

Pasal 10

INTEGRITAS AKADEMIK



- (1) Pelaksana penelitian wajib menjunjung tinggi integritas akademik yaitu komitmen dalam bentuk perbuatan yang berdasarkan pada nilai kejujuran, kredibilitas, kewajaran, kehormatan, dan tanggung jawab dalam kegiatan penelitian yang dilaksanakan.
- (2) Penelitian dilakukan sesuai dengan kerangka etika, hukum dan profesionalitas, serta kewajiban sesuai dengan peraturan yang berlaku.
- (3) Penelitian dilakukan dengan menjunjung tinggi standar ketelitian dan integritas tertinggi dalam semua aspek penelitian.

Pasal 11

KEADAAN MEMAKSA

- (1) PARA PIHAK dibebaskan dari tanggung jawab atas keterlambatan atau kegagalan dalam memenuhi kewajiban yang dimaksud dalam kontrak Penelitian disebabkan atau diakibatkan oleh peristiwa atau kejadian di luar kekuasaan PARA PIHAK yang dapat digolongkan sebagai keadaan memaksa (*force majeure*).
- (2) Peristiwa atau kejadian yang dapat digolongkan keadaan memaksa (*force majeure*) dalam Kontrak Penelitian ini adalah bencana alam, wabah penyakit, kebakaran, perang, blokade, sabotase, revolusi, pemberontakan, huru-hara, serta adanya tindakan pemerintah dalam bidang ekonomi dan moneter yang secara nyata berpengaruh terhadap pelaksanaan Kontrak Penelitian ini.
- (3) Apabila terjadi keadaan memaksa (*force majeure*), maka pihak yang mengalami wajib memberitahukan kepada pihak lainnya secara tertulis, selambat-lambatnya 7 (tujuh) hari kerja sejak terjadinya keadaan memaksa (*force majeure*), disertai dengan bukti-bukti yang sah dari pihak yang berwajib, dan PARA PIHAK dengan i'tikad baik akan segera membicarakan penyelesaiannya.

Pasal 12

PENYELESAIAN SENGKETA

Apabila terjadi perselisihan antara **PIHAK PERTAMA** dan **PIHAK KEDUA** dalam pelaksanaan perjanjian ini akan dilakukan penyelesaian secara musyawarah dan mufakat, dan apabila tidak tercapai penyelesaian secara musyawarah dan mufakat, maka penyelesaian dilakukan melalui proses hukum.

Pasal 13

AMANDEMEN KONTRAK

Apabila terdapat hal lain yang belum diatur atau terjadi perubahan dalam Kontrak Penelitian ini, maka akan dilakukan amandemen Kontrak Penelitian.

Pasal 14

SANKSI

- (1) Apabila sampai dengan batas waktu yang telah ditetapkan untuk melaksanakan penelitian ini telah berakhir, **PIHAK KEDUA** tidak melaksanakan kewajiban sebagaimana dimaksud pada Pasal 5 ayat (2), maka **PIHAK KEDUA** dikenakan sanksi administratif.
- (2) Sanksi administratif sebagaimana dimaksud pada ayat (1) dapat berupa: penghentian pembayaran dan/atau Ketua Tim Pelaksana Penelitian tidak dapat mengajukan proposal penelitian dalam waktu dua tahun berturut-turut.
- (3) Mengembalikan dana penelitian yang telah diterimakan kepada Kas Negara, jika diminta oleh pihak pemberi dana.



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Pasal 15

KETENTUAN LAIN-LAIN

- (1) Dalam hal PIHAK PERTAMA berhenti dari jabatannya sebagai Kepala LPPM sebelum Kontrak Penelitian ini selesai, maka PIHAK PERTAMA wajib melakukan serah terima tanggung jawabnya kepada pejabat baru yang menggantikannya.
- (2) Dalam hal PIHAK KEDUA berhalangan tetap atau tidak dapat melaksanakan tugas sebagai Ketua Tim Pelaksana sebelum Kontrak Penelitian ini selesai, maka PIHAK KEDUA wajib melakukan pergantian dengan anggota peneliti yang memenuhi persyaratan.

Pasal 16

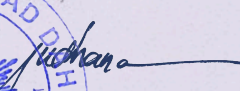

PERALIHAN

Seluruh kegiatan penelitian yang sudah dilakukan PIHAK KEDUA berdasarkan Kontrak Penelitian Tahun Jamak Penelitian Dasar dan Pembinaan/Kapasitas Tahun Anggaran 2021 antara Direktorat Riset dan Pengabdian Masyarakat, Deputi Bidang Penguatan Riset dan Pengembangan, Kementerian Riset dan Teknologi/Badan Riset dan Inovasi Nasional dengan (LLDIKTI WILAYAH V) Nomor 165/SP2H/LT/DRPM/2021 tanggal 18 Maret 2021 dan Kontrak Penelitian Tahun Jamak Penelitian Dasar dan Pembinaan/Kapasitas Tahun Anggaran 2021 antara LLDIKTI Wilayah V dengan Rektor Universitas Ahmad Dahlan nomor 1805.6/LL5/PG/2021 tanggal 19 April 2021 tetap dapat dilaksanakan dan diakui sampai dengan ditandatanganinya Kontrak Penelitian ini.

Pasal 17

PENUTUP

Perjanjian ini dibuat dan ditandatangani oleh **PARA PIHAK** pada hari dan tanggal tersebut di atas, dibuat dalam rangkap 2 (dua) dan bermeterai cukup sesuai dengan ketentuan yang berlaku, yang masing-masing mempunyai kekuatan hukum yang sama.

PIHAK PERTAMA,


Anton Yudianto, M.T., Ph.D.
NIP/NIY: 600510143

PIHAK KEDUA,

SOLIKHAH
NIP/NIY: 60050527



Pasal 15

KETENTUAN LAIN-LAIN

- (1) Dalam hal PIHAK PERTAMA berhenti dari jabatannya sebagai Kepala LPPM sebelum Kontrak Penelitian ini selesai, maka PIHAK PERTAMA wajib melakukan serah terima tanggung jawabnya kepada pejabat baru yang menggantikannya.
- (2) Dalam hal PIHAK KEDUA berhalangan tetap atau tidak dapat melaksanakan tugas sebagai Ketua Tim Pelaksana sebelum Kontrak Penelitian ini selesai, maka PIHAK KEDUA wajib melakukan pergantian dengan anggota peneliti yang memenuhi persyaratan.

Pasal 16

PERALIHAN

Seluruh kegiatan penelitian yang sudah dilakukan PIHAK KEDUA berdasarkan Kontrak Penelitian Tahun Jamak Penelitian Dasar dan Pembinaan/Kapasitas Tahun Anggaran 2021 antara Direktorat Riset dan Pengabdian Masyarakat, Deputi Bidang Penguatan Riset dan Pengembangan, Kementerian Riset dan Teknologi/Badan Riset dan Inovasi Nasional dengan (LLDIKTI WILAYAH V) Nomor 165/SP2H/LT/DRPM/2021 tanggal 18 Maret 2021 dan Kontrak Penelitian Tahun Jamak Penelitian Dasar dan Pembinaan/Kapasitas Tahun Anggaran 2021 antara LLDIKTI Wilayah V dengan Rektor Universitas Ahmad Dahlan nomor 1805.6/LL5/PG/2021 tanggal 19 April 2021 tetap dapat dilaksanakan dan diakui sampai dengan ditandatanganinya Kontrak Penelitian ini.

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PENUTUP

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PIHAK PERTAMA,



Anton Yudhana, M.T., Ph.D.
NIP/NIT: 000000000

PIHAK KEDUA,


SOLIKHAH
NIP/NIT: 60050527

PROTEKSI ISI LAPORAN KEMAJUAN PENELITIAN

Dilarang menyalin, menyimpan, memperbanyak sebagian atau seluruh isi laporan ini dalam bentuk apapun kecuali oleh peneliti dan pengelola administrasi penelitian

LAPORAN KEMAJUAN PENELITIAN MULTI TAHUN

ID Proposal: 98269d40-a331-49f5-a301-4834549a63a1
Laporan Kemajuan Penelitian: tahun ke-1 dari 2 tahun

1. IDENTITAS PENELITIAN

A. JUDUL PENELITIAN

Model pengembangan instrumen dan uji psychometric properties instrumen kualitas hidup kanker payudara dan kanker servik di era pandemi covid-19

B. BIDANG, TEMA, TOPIK, DAN RUMPUN BIDANG ILMU

Bidang Fokus RIRN / Bidang Unggulan Perguruan Tinggi	Tema	Topik (jika ada)	Rumpun Bidang Ilmu
Kesehatan	Pengembangan dan penguatan sistem kelembagaan, kebijakan kesehatan, dan pemberdayaan masyarakat dalam mendukung kemandirian obat	Penguatan pengetahuan dan pengembangan kebiasaan masyarakat dalam berperilaku sehat	Kesehatan Masyarakat

C. KATEGORI, SKEMA, SBK, TARGET TKT DAN LAMA PENELITIAN

Kategori (Kompetitif Nasional/ Desentralisasi/ Penugasan)	Skema Penelitian	Strata (Dasar/ Terapan/ Pengembangan)	SBK (Dasar, Terapan, Pengembangan)	Target Akhir TKT	Lama Penelitian (Tahun)
Penelitian Kompetitif Nasional	Penelitian Dasar	SBK Riset Dasar	SBK Riset Dasar	3	2

2. IDENTITAS PENGUSUL

Nama, Peran	Perguruan Tinggi/ Institusi	Program Studi/ Bagian	Bidang Tugas	ID Sinta	H-Index
SOLIKHAH Ketua Pengusul	Universitas Ahmad Dahlan	Kesehatan Masyarakat		22975	3
Dr DYAH ARYANI PERWITASARI S.Si, M.Si Anggota Pengusul 1	Universitas Ahmad Dahlan	Profesi Apoteker	Kajian analisis kualitas hidup pasien kanker, interpretasi hasil analisis, pengecekan konten kualitas hidup, penyusunan draft artikel ilmiah, metodologi, penyusunan laporan penelitian	260011	8

3. MITRA KERJASAMA PENELITIAN (JIKA ADA)

Pelaksanaan penelitian dapat melibatkan mitra kerjasama, yaitu mitra kerjasama dalam melaksanakan penelitian, mitra sebagai calon pengguna hasil penelitian, atau mitra investor

Mitra	Nama Mitra
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4. LUARAN DAN TARGET CAPAIAN

Luaran Wajib

Tahun Luaran	Jenis Luaran	Status target capaian (<i>accepted, published, terdaftar atau granted, atau status lainnya</i>)	Keterangan (<i>url dan nama jurnal, penerbit, url paten, keterangan sejenis lainnya</i>)
1	Artikel di Jurnal Internasional Terindeks di Pengindeks Bereputasi	Accepted	Health Care for Women International

Luaran Tambahan

Tahun Luaran	Jenis Luaran	Status target capaian (<i>accepted, published, terdaftar atau granted, atau status lainnya</i>)	Keterangan (<i>url dan nama jurnal, penerbit, url paten, keterangan sejenis lainnya</i>)
1	Artikel di Jurnal Nasional terakreditasi peringkat 1-3	Accepted	Media Kesehatan Masyarakat Indonesia

5. ANGGARAN

Rencana anggaran biaya penelitian mengacu pada PMK yang berlaku dengan besaran minimum dan maksimum sebagaimana diatur pada buku Panduan Penelitian dan Pengabdian kepada Masyarakat Edisi 12.

Total RAB 2 Tahun Rp. 614,000,000

Tahun 1 Total Rp. 307,000,000

Jenis Pembelanjaan	Item	Satuan	Vol.	Biaya Satuan	Total
Analisis Data	HR Pengolah Data	P (penelitian)	5	1,540,000	7,700,000
Analisis Data	HR Sekretariat/Administrasi Peneliti	OB	8	300,000	2,400,000
Analisis Data	Transport Lokal	OK (kali)	38	140,000	5,320,000
Analisis Data	Biaya konsumsi rapat	OH	60	51,000	3,060,000
Analisis Data	Uang Harian	OH	80	170,000	13,600,000
Bahan	ATK	Paket	1	31,118,500	31,118,500
Bahan	Bahan Penelitian (Habis Pakai)	Unit	1	27,300,938	27,300,938
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Biaya seminar internasional	Paket	1	2,000,000	2,000,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Biaya Publikasi artikel di Jurnal Nasional	Paket	1	3,000,000	3,000,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Publikasi artikel di Jurnal Internasional	Paket	1	27,629,562	27,629,562
Pelaporan, Luaran Wajib, dan Luaran Tambahan	HR Sekretariat/Administrasi Peneliti	OB	8	300,000	2,400,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Uang harian rapat di luar kantor	OH	40	170,000	6,800,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Uang harian rapat di dalam kantor	OH	90	140,000	12,600,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Biaya konsumsi rapat	OH	90	51,000	4,590,000
Pengumpulan Data	Uang harian rapat di luar kantor	OH	30	420,000	12,600,000
Pengumpulan Data	Uang Harian	OH	40	170,000	6,800,000
Pengumpulan Data	HR Pembantu Lapangan	OH	90	80,000	7,200,000

Jenis Pembelanjaan	Item	Satuan	Vol.	Biaya Satuan	Total
Pengumpulan Data	Biaya konsumsi	OH	221	51,000	11,271,000
Pengumpulan Data	Uang harian rapat di dalam kantor	OH	450	170,000	76,500,000
Pengumpulan Data	HR Petugas Survei	OH/OR	2900	8,000	23,200,000
Sewa Peralatan	Peralatan penelitian	Unit	22	905,000	19,910,000

Tahun 2 Total Rp. 307,000,000

Jenis Pembelanjaan	Item	Satuan	Vol.	Biaya Satuan	Total
Analisis Data	HR Pengolah Data	P (penelitian)	2	1,500,000	3,000,000
Analisis Data	Honorarium narasumber	OJ	2	6,800,000	13,600,000
Analisis Data	Biaya analisis sampel	Unit	4	1,540,000	6,160,000
Analisis Data	Penginapan	OH	4	3,400,000	13,600,000
Analisis Data	HR Sekretariat/Administrasi Peneliti	OB	8	300,000	2,400,000
Analisis Data	Uang Harian	OH	40	140,000	5,600,000
Analisis Data	Transport Lokal	OK (kali)	40	140,000	5,600,000
Bahan	ATK	Paket	1	5,500,000	5,500,000
Bahan	Bahan Penelitian (Habis Pakai)	Unit	1	37,200,000	37,200,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Biaya seminar internasional	Paket	1	3,000,000	3,000,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Publikasi artikel di Jurnal Internasional	Paket	1	29,040,000	29,040,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	HR Sekretariat/Administrasi Peneliti	OB	8	300,000	2,400,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Uang harian rapat di dalam kantor	OH	40	140,000	5,600,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Uang harian rapat di luar kantor	OH	40	170,000	6,800,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Biaya konsumsi rapat	OH	80	510,000	40,800,000
Pengumpulan Data	FGD persiapan penelitian	Paket	1	9,000,000	9,000,000
Pengumpulan Data	HR Sekretariat/Administrasi Peneliti	OB	8	300,000	2,400,000
Pengumpulan Data	Transport	OK (kali)	80	150,000	12,000,000
Pengumpulan Data	Uang Harian	OH	100	170,000	17,000,000
Pengumpulan Data	Biaya konsumsi	OH	100	51,000	5,100,000
Pengumpulan Data	HR Pembantu Peneliti	OJ	480	25,000	12,000,000
Pengumpulan Data	HR Petugas Survei	OH/OR	6000	8,000	48,000,000
Sewa Peralatan	Peralatan penelitian	Unit	1	10,000,000	10,000,000
Sewa Peralatan	Transport penelitian	OK (kali)	80	140,000	11,200,000

6. KEMAJUAN PENELITIAN

A. RINGKASAN: Tuliskan secara ringkas latar belakang penelitian, tujuan dan tahapan metode penelitian, luaran yang

ditargetkan, serta uraian TKT penelitian.

Latar belakang: Pandemi Covid-19 telah berdampak besar bagi pelayanan dan perawatan kesehatan termasuk kanker di seluruh dunia. Sistem pelayanan kesehatan hampir disemua negara mengalami perubahan dan akhirnya berdampak pada pelayanan pada penyakit lainnya termasuk penyakit kanker. Terapi pengobatan yang lama dan membutuhkan biaya yang tidak sedikit menyebabkan pasien kanker berdampak pada kondisi fisik dan psikologis. Selain itu pasien kanker juga seringnya di diagnosis menderita kormobid seperti diabetes, hipertensi, gagal ginjal dan lain sebagainya akan memperparah kondisi psikologis dan memperberat beban finansial keluarga, yang berdampak pada kualitas hidup pasien kanker. Ketepatan dan keberhasilan penilaian kualitas hidup pada pasien kanker sangat diperlukan dan ini tergantung pada instrumen yang dirancang dan divalidasi dengan cermat. Namun instrument untuk mengukur secara spesifik kualitas hidup pasien kanker payudara dan kanker serviks belum begitu familiar diterapkan untuk membantu menunjang perawatan pasien. Meskipun telah tervalidasi di negara barat, keragaman sosiodemografis, budaya termasuk agama (socio - culture) dapat menghasilkan interpretasi yang berbeda tentang kualitas hidup, jadi sangat penting untuk menilai akseptabilitas, kehandalan dan validitas serta kesesuaian untuk diterapkan di Indonesia.

Tujuan penelitian ini untuk melakukan validasi dan psychometric properties instrumen kualitas hidup QOL-BR45 dan QOL-CX24 mulai dari menilai aksestabilitas, adaptasi, validasi dan reliability melalui uji psychometric properties terhadap instrumen kualitas hidup kanker payudara dan kanker servik. Selain itu juga menilai kualitas hidup pasien kanker di era pandemic Covid-19.

Tahapan metode penelitian: Desain penelitian ini adalah cross-sectional yang mengambil sampel pasien kanker servik dan kanker payudara di bagian onkologi di RS Kariadi Semarang dan RS Muwardi berusia ≥ 18 tahun. Tahapan penelitian, Tahap 1 melakukan adaptasi dari instrumen QOL-BR45 dan QOL-CX24 dan memvalidasi ke dalam bahasa Indonesia dengan menggunakan metode back-translation. Tahap 2, uji sifat psikometrik akan dilakukan untuk membangun validitas konstruk dan validitas kriteria yang terkait.

Luaran yang ditargetkan: luaran wajib berupa artikel dengan status accepted di Open Access Macedonian Journal of Medical Sciences (SJR=0,288), dan Q3) dan luaran tambahan di seminar internasional UPHEC 2021 tanggal 7-8 Juli 2021 di Yogyakarta, serta artikel di Asian pacific journal of cancer prevention (underreview, SJR=0,512).

Uraian TKT: TKT:1-3. Melakukan eksplorasi teori dasar dari pemahaman masyarakat serta kondisi fisik dan psikologis terkait kualitas hidup pasien kanker payudara dan kanker servik. Selanjutnya disusun formula konsep dasar untuk mengukur perkembangan kualitas hidup pasien kanker tersebut untuk meningkatkan survival penderita, sehingga nantinya dapat digunakan untuk oleh tenaga medis, paramedic serta pemangku kebijakan untuk upaya meningkatkan harapan hidup pasien kanker dan meningkatkan prolonging life pasien serta pencegahan depresi penderita kanker payudara dan kanker servik.

Hasil penelitian: 612 pasien kanker payudara dan 246 pasien kanker serviks diwawancarai selama rentang Juni 2021-Oktober 2021. Validitas internal untuk instrumen kualitas hidup kanker payudara dan kanker serviks versi Bahasa sangat baik (Cronbach alpha=0,7). Semua item dalam instrumen memenuhi validitas konvergen dan diskriminan, kecuali item ET_68, BS_75 dan ET_54 (untuk QLQ BR45) dan item SE_42 (untuk QLQ CX24). Pada akhirnya QLQ BR45 dan QLQ CX 24 dapat diterapkan di Indonesia untuk menilai kualitas hidup kanker payudara dan kanker serviks.

B. KATA KUNCI: Tuliskan maksimal 5 kata kunci.

Quality of life; breast cancer, cervical cancer, psychometric properties

disarankan ringkas mungkin. Dilarang menghapus/modifikasi template ataupun menghapus penjelasan di setiap poin.

C. HASIL PELAKSANAAN PENELITIAN: Tuliskan secara ringkas hasil pelaksanaan penelitian yang telah dicapai sesuai tahun pelaksanaan penelitian. Penyajian dapat berupa data, hasil analisis, dan capaian luaran (wajib dan atau tambahan). Seluruh hasil atau capaian yang dilaporkan harus berkaitan dengan tahapan pelaksanaan penelitian sebagaimana direncanakan pada proposal. Penyajian data dapat berupa gambar, tabel, grafik, dan sejenisnya, serta analisis didukung dengan sumber pustaka primer yang relevan dan terkini.

Pengisian poin C sampai dengan poin H mengikuti template berikut dan tidak dibatasi jumlah kata atau halaman namun disarankan ringkas mungkin. Dilarang menghapus/memodifikasi template ataupun menghapus penjelasan di setiap poin.

C. HASIL PELAKSANAAN PENELITIAN: Tuliskan secara ringkas hasil pelaksanaan penelitian yang telah dicapai sesuai tahun pelaksanaan penelitian. Penyajian meliputi data, hasil analisis, dan capaian luaran (wajib dan atau tambahan). Seluruh hasil atau capaian yang dilaporkan harus berkaitan dengan tahapan pelaksanaan penelitian sebagaimana direncanakan pada proposal. Penyajian data dapat berupa gambar, tabel, grafik, dan sejenisnya, serta analisis didukung dengan sumber pustaka primer yang relevan dan terkini.

1. Tahap 1: translation and back translation method

Dalam tahapan ini, instrumen EORTC QLQ BR45 dan EORTC QLQ CX24 versi Indonesia, kata medis seperti yang sulit diterjemahkan dalam bahasa keseharian dan terlaui sensitif untuk ditanyakan kepada subjek penelitian, sehingga di terjemahkan ke dalam bahasa Indonesia yang lebih mudah dipahami. Pertanyaan pada EORTC QLQ BR45, pertanyaan tentang kosmetik payudara maka diganti dengan hasil operasi pembesahan payudara. Pertanyaan pada EORTC QLQ CX24, kebocoran urin dan vagina terasa pendek maka diterjemahkan menjadi sulit menahan buang air kecil dan vagina terasa tidak seperti biasanya saat aktif berhubungan seksual dengan pasangan. Ada beberapa perbedaan dalam terjemahan balik kuesioner tetapi penerjemah berpendapat bahwa perbedaan tersebut tidak akan mengubah arti kata, karena bahasa Indonesia memiliki kosa kata yang lebih sedikit daripada bahasa Inggris. Dalam proses ini, instrumen versi English dan versi Indonesia dibandingkan, meskipun ada perbedaan bahasa namun semua translator berpendapat bahwa itu hanya pada gaya bahasa dan pemilihan kosakata namun tidak mengubah makna ungkapan. Tujuan dari tahapan ini adalah untuk menilai *face validity* dalam mengukur konsep dasar utama dalam menilai kualitas hidup pasien kanker payudara dan kanker serviks di dalam instrumen versi Indonesia tersebut.

2. Tahap II: Pilot test

Pada tahap ini, instrumen EORTC QLQ BR45 dan EORTC QLQ CX24 diujicobakan ke pasien kanker payudara dan kanker serviks untuk memperoleh tanggapan untuk mengevaluasi penggunaan kosa kata ataupun bahasa yang dipakai dalam kuesioner tersebut mudah dipahami oleh pasien. Pasien dengan umur paling tidak 18 tahun sebanyak 20 orang digunakan sebagai *pilot testing questionnaire*

3. Tahap III: main study (psychometric validation)

a. Karakteristik subjek penelitian

Dari total 612 pasien kanker payudara, didapatkan bahwa mayoritas berasal dari RS Moewardi Surakarta sebanyak 333 orang (54.42%) dengan kelompok usia 50-59 tahun yaitu 221 orang (37.91%) serta rentang 19-82 tahun (Mean = 52.06, SD = 9.59). Sebagian besar pasien memiliki pendidikan terakhir *primary school* sebanyak 184 orang (30.07%), berstatus menikah sebanyak 594 orang (97.06%), beragama muslim sebanyak 589 orang (96.24%), dan sedang tidak bekerja sebanyak 331 orang (54.08%). Mayoritas pasien didiagnosis stadium awal kanker sebanyak 160 orang (26.14%) dan tidak memiliki komorbid sebanyak 500 orang (81.7%). Pasien memiliki pendapatan <2,500,000 IDR sebanyak 437 orang (71.41%), memiliki BPJS sebanyak 611 orang (99.84%) dan tidak kesulitan dalam finansial sebanyak 600 orang (98.04%). More details can be seen in **Table 1**.

Table 1. Participants Characteristics of Breast Cancer (N=612)

Characteristics	n	%
Age		
Mean (SD)	52.06 (9.59)	
Range	19-82	
10-19y	1	0.03
20-29y	1	0.03
30-39y	53	5.45
40-49y	197	27.03
50-59y	221	37.91
60-69y	119	24.49
70-79y	14	3.36
≥80y	6	1.65
Educational status		
No education	35	5.72
Primary school	184	30.07
Junior high school	117	19.12
Senior high school	181	29.58
Bachelor degree	23	3.76

Characteristics	n	%
Postgraduate degree	72	11.76
Marital status		
Married	594	97.06
Single/Widowed/separate/discovered	18	2.94
Monthly income		
< 2,500,000 IDR* (< 175.68 USD)	437	71.41
≥ 2,500,000 IDR* (≥ 175.68 USD)	175	28.59
Religion		
Muslim	589	96.24
Christians	21	3.43
Others	2	0.33
Occupation		
No employment	331	54.08
Farmer	46	7.52
Trader	2	0.33
Labourer	160	26.14
Government/official/enterprise/business	73	11.93
Health insurance		
BPJS (Universal Coverage)	611	99.84
Private Health Insurance	1	0.16
Stage of tumor		
Stage I	160	26.14
Stage II	140	22.88
Stage III	147	24.02
Stage IV	66	10.78
Stage V	99	16.18
Comorbidity		
Yes	112	18.30
No	500	81.70
Financial difficulties		
Yes	12	1.96
No	600	98.04
Hospital		
Karyadi Semarang Hospital	279	45.58
Muwardi Surakarta Hospital	333	54.42

Dari total 246 pasien kanker serviks, didapatkan bahwa mayoritas berasal dari RS Moewardi Surakarta sebanyak 200 orang (89.69%) dengan kelompok usia 50-59 tahun yaitu 119 orang (48.73%) serta rentang 15-82 tahun (Mean = 53.95, SD = 9.011). Sebagian besar pasien memiliki pendidikan terakhir *primary school* sebanyak 134 orang (54.47%), berstatus menikah sebanyak 243 orang (98.78%), beragama muslim sebanyak 233 orang (94.72%), dan sedang tidak bekerja sebanyak 133 orang (54.07%). Mayoritas pasien didiagnosis stadium tiga kanker sebanyak 129 orang (52.44%) dan tidak memiliki komorbid sebanyak 212 orang (86.18%). Pasien memiliki pendapatan <2,500,000 IDR sebanyak 203 orang (82.52%), memiliki BPJS sebanyak 245 orang (99.59%) dan tidak kesulitan dalam finansial sebanyak 241 orang (97.97%). More details can be seen in **Table 2**.

Table 2. Participants Characteristics of Cervix Cancer (N=246)

Characteristics	n	%
Age		
Mean (SD)	53.95 (9.011)	
Range	15-82	
10-19y	1	0.08
20-29y	2	0.33
30-39y	15	3.69
40-49y	43	14.09
50-59y	119	48.73
60-69y	59	28.99
70-79y	6	3.44
≥80y	1	0.08

Characteristics	n	%
Educational status		
No education	20	8.13
Primary school	134	54.47
Junior high school	42	17.07
Senior high school	29	11.79
Bachelor degree	5	2.03
Postgraduate degree	6	2.44
Marital status		
Married	243	98.78
Single/Widowed/separate/discovered	3	1.22
Monthly income		
< 2,500,000 IDR* (< 175.68 USD)	203	82.52
≥ 2,500,000 IDR* (≥ 175.68 USD)	43	17.48
Religion		
Muslim	233	94.72
Christians	12	4.88
Others	2	0.81
Occupation		
No employment	133	54.07
Farmer	29	11.79
Trader	11	4.47
Labourer	43	17.48
Government/official/enterprise/business	30	12.20
Health insurance		
BPJS (Universal Coverage)	245	99.59
Private Health Insurance	1	0.41
Stage of tumor		
Stage I	36	14.63
Stage II	70	28.46
Stage III	129	52.44
Stage IV	11	4.47
Comorbidity		
Yes	34	13.82
No	212	86.18
Financial difficulties		
Yes	5	2.03
No	241	97.97
Hospital		
Karyadi Semarang Hospital	46	10.31
Muwardi Surakarta Hospital	200	89.69

b. Diskriminan dan internal consistensi

Berdasarkan kriteria fit model instrument, model instrument versi Bahasa Indonesia dari QLQ BR45 dan QLQ CX24 menunjukkan model yang fit/cocok, hal ini terlihat dari nilai Selain itu berdasarkan Uji Kaiser-Meyer-Olkin (KMO) sebesar 0,78 dan Bartlett ($\chi^2 = 2170,830$, $df = 66$, $p < 0.001$), instrumen versi Indonesia sangat cocok untuk analisis faktor. Cornbach's alpha menunjukkan bahwa seluruh subscale EORTC QLQ-BR45 memiliki reliabilitas yang baik dengan nilai 0,823. More details can be seen in Table 5. Pada instrumen EORTC QLQ-CX24 yang memiliki reliabilitas yang baik dengan nilai > 0.7 adalah Symptom Experience, Body Image, dan Sexual/Vaginal Functioning. More details can be seen in Table 6. Tabel 7 menunjukkan factor loading dari setiap item pada 12 scale pembentuk EORTC QLQ-BR45. Tabel 7, dari 48 item di EORTC QLQ-BR45 dari validitas convergen terlihat bahwa nilai factor loadingnya adalah diatas 0,2 kecuali item pertanyaan nomer 54, 68, 69, dan 74. Sementara itu nilai validitas convergen dari EORTC QLQ-CX24, terdapat item no 42 dibawah nilai 0,2 (Table 8)

Berdasarkan Tabel 3, didapatkan bahwa subscale *Body image* berhubungan positif secara signifikan dengan seluruh subscale. Subscale Sexual Functioning berhubungan positif secara signifikan dengan subscale Body Image, Sexual enjoyment, Future perspective, dan Upset by hair loss, namun berhubungan negative dengan subscale Endocrine therapy scale. Subscale Sexual enjoyment berhubungan positif secara signifikan dengan subscale Body Image, Sexual Functioning, Future perspective, Upset by hair loss, dan Endocrine sexual scale,

namun berhubungan negative dengan Arm symptoms. Subscale Future perspective berhubungan positif secara signifikan dengan subscale seluruh subscale kecuali Breast satisfaction. Subscale Breast satisfaction berhubungan positif secara signifikan dengan subscale Endocrine sexual scale, namun berhubungan negative dengan Body image. Subscale Systemic therapy side effects berhubungan positif secara signifikan dengan subscale body image, Future perspective, Breast symptoms, Arm symptoms, Upset by hair loss, Endocrine therapy scale, dan Skin/mucosis scale. Subscale Breast symptoms berhubungan positif secara signifikan dengan subscale body image, Future perspective, Systemic therapy side effects, Arm symptoms, Upset by hair loss, Endocrine therapy scale, dan Skin/mucosis scale.

Subscale Arm symptoms berhubungan positif secara signifikan dengan subscale Body image, Future perspective, Breast satisfaction, Systemic therapy side effects, Breast symptoms, Upset by hair loss, Endocrine therapy scale, dan Endocrine sexual scale, namun berhubungan negative dengan Sexual Functioning dan Sexual enjoyment. Subscale Upset by hair loss berhubungan positif secara signifikan dengan subscale Body image, Sexual Functioning, Future perspective, Systemic therapy side effects, Breast symptoms, Arm symptoms, Endocrine therapy scale, dan Skin/mucosis scale, namun berhubungan negative dengan Sexual enjoyment. Subscale Endocrine therapy scale berhubungan positif secara signifikan dengan subscale body image, Future perspective, Systemic therapy side effects, Arm symptoms, Upset by hair loss, Endocrine sexual scale, dan Skin/mucosis scale. Subscale Endocrine sexual scale berhubungan positif secara signifikan dengan subscale body image, Sexual enjoyment, Future perspective, Breast satisfaction, dan Endocrine therapy scale. Subscale Skin/mucosis scale berhubungan positif secara signifikan dengan subscale body image, Future perspective, Systemic therapy side effects Breast symptoms, Arm symptoms, Upset by hair loss, dan Endocrine therapy scale.

Table 3. Interfactors Correlation of the EORTC QLQ-BR54 Subscale Score

Domains	BI	SX	SE	FU	BS	SYS	BR	ARM	HU	ET	ES	SM
Functioning Scale												
Body Image	1	0.137**	0.149**	0.462***	0.137*	0.361*	0.204*	0.236*	0.325**	0.358*	0.176*	0.228***
	(-0.409-1.815)	(-0.188-0.255)	(-0.238-0.572)	(0.56-0.934)	(-0.230-0.048)	(0.019-0.116)	(-0.004-0.119)	(0.073-0.100)	(0.181-0.596)	(-0.053-0.134)	(0.046-0.202)	(-0.092-0.053)
Sexual Functioning	0.137**	1	0.839**	0.157***	-0.043	-0.009	-0.027	-0.09	0.1*	0.041*	0.075	-0.053
	(-0.025-0.033)	(0.605-1.395)	(1.558-1.693)	(-0.032-0.110)	(-0.054-0.013)	(-0.025-0.011)	(-0.017-0.028)	(-0.034-0.028)	(0.005-0.146)	(-0.034-0.004)	(-0.025-0.032)	(-0.033-0.019)
Sexual enjoyment	0.149**	0.893**	1	0.159***	-0.015	0.016	-0.034	0.086*	0.083*	0.015	0.081*	-0.019
	(-0.009-0.022)	(0.465-0.506)	(0.378-0.062)	(-0.032-0.045)	(-0.007-0.029)	(-0.007-0.012)	(-0.016-0.008)	(0.026-0.008)	(-0.064-0.19)	(0.001-0.017)	(-0.013-0.018)	(0.013-0.016)
Future perspective	0.462**	0.157**	0.159**	1	-0.047	0.313*	0.168*	0.235*	0.31***	0.27**	0.135*	0.204***
	(0.093-0.156)	(0.041-0.14)	(0.138-0.193)	(-0.712-0.196)	(-0.027-0.047)	(0.003-0.037)	(0.018-0.032)	(0.001-0.069)	(0.068-0.237)	(0.007-0.027)	(0.002-0.066)	(-0.025-0.034)
Breast satisfaction	0.137**	0.043	-0.015	-0.047	1	0.001	-0.066	-0.037	-0.053	0.024	0.108*	0.067
	(-0.176-0.037)	(0.313-0.074)	(-0.136-0.572)	(0.126-0.218)	(6.454-8.017)	(-0.028-0.058)	(-0.083-0.024)	(-0.103-0.048)	(-0.278-0.089)	(0.024-0.049)	(-0.148-0.012)	(0.000-0.126)
Symptoms scales/item												
Systemic therapy side effects	0.361**	-0.009	0.016	0.313***	0.001	1	0.253*	0.402*	0.399**	0.449*	0.016	0.412***
	(0.051-0.312)	(-0.503-0.222)	(0.482-0.845)	(-0.041-0.600)	(0.098-0.202)	(4.462-)	(0.019-0.183)	(0.184-0.462)	(0.757-1.423)	(0.101-0.235)	(0.170-0.086)	(0.113-0.347)
Breast symptoms	0.204**	-0.027	-0.034	0.168***	-0.066	-	1	0.432*	0.113**	0.169*	0.056	0.207***
	(0.006-0.202)	(-0.218-0.358)	(-0.698-0.356)	(-0.181-0.330)	(0.184-0.054)	(0.012-0.115)	(2.240-5.078)	(0.385-0.595)	(-0.390-0.157)	(0.081-0.027)	(-0.057-0.147)	(-0.027-0.161)
Arm symptom	0.236**	-0.09*	-0.086*	0.235***	-	0.402*	0.432*	1	0.216**	0.32**	-	0.328(0.023-
	(-0.224-)	(-0.224-)	(-0.577-)	(0.006-)	(0.037* -)	(** -)	(** -)	(0.022-)	(*(- -)	(* -)	(0.001* -)	(23-

Domains	BI	SX	SE	FU	BS	SYS	BR	ARM	HU	ET	ES	SM
s	0.062-0.086)	0.187)	0.174)	0.657)	** (-0.116-0.054)	(0.059)	(0.195)	2.037)	0.101-0.288)	(0.005)	** (-0.117-0.028)	0.156)
Upset by hair loss	0.325** (-0.026-0.087)	0.1* (-0.006-0.163)	-0.083* (-0.239-0.070)	0.31*** (-0.059-0.207)	-0.053 (-0.053-0.017)	0.399** (-0.041-0.077)	0.113* (-0.033-0.013)	0.216* (-0.017-0.049)	1 (0.040-0.886)	0.213* (-0.020-0.012)	(-0.082-0.023)	0.209*** (-0.012-0.043)
Target symptom scale												
Endocrine therapy scale	0.358** (-0.197-0.502)	-0.041 (-0.966-0.115))	0.015 (0.057-1.617)	0.27*** (-0.154-0.604)	0.024 (-0.115-0.239)	0.449** (-0.141-0.326)	0.169 (-0.179-0.059)	0.32** (0.020-0.352)	0.213** (-0.514-0.298)	1 (2.526-6.761)	0.091* (-0.068-0.234)	0.528*** (0.546-0.803)
Endocrine sexual scale	0.176** (-0.049-0.212)	0.075 (-0.197-0.257)	0.081* (-0.342-0.489)	0.135** (-0.012-0.413)	0.108* (-0.204-0.017)	0.016* (-0.067-0.034)	0.056 (-0.035-0.091)	-0.001 (-0.142-0.034)	-0.068 (-0.590-0.164))	0.091* (-0.019-0.066)	1 (4.15-7-6.279)	0.053 (-0.047-0.101)
Skin/mucosis scale	0.228** (-0.113-0.065)	-0.053 (-0.313-0.178)	-0.019 (-0.339-0.499)	0.204*** (-0.185-0.250)	0.067 (0.000-0.202)	0.412** (-0.052-0.159)	0.207* (-0.020-0.117)	0.328* (-0.033-0.223)	0.209** (-0.103-0.362)	0.528* (-0.180-0.265)	0.053 (-0.055-0.119)	1 (0.702-3.150)

***, p<0.001; **, p<0.01; *, p<0.05

Table 4. Interfactors Correlation of the EORTC QLQ-CX24 Subscale Score

Domains	SE	BI	SV	LY	PN	MS	SXW	SXA	SXE
Symptom Experience	1 (8.837-14.493)	0.394*** (0.556-1.148)	0.11 (-0.867-0.165)	0.274*** (0.543-2.621)	0.195** (-0.440-0.639)	0.379*** (0.778-1.872)	0.087 (0.125-1.041)	-0.114 (-3.554-0.676)	-0.095 (-1.142-2.389)
Body Image	0.394*** (0.091-0.188)	1 (-2.194-0.387)	0.214** (0.042-0.457)	0.225*** (0.014-0.864)	0.098 (-0.134-0.303)	0.189** (-0.133-0.330)	0.109 (-0.188-0.188)	0.188** (-0.478-1.240)	0.041* (-0.801-0.630)
Sexual/Vaginal Functioning	-0.11 (-0.053-0.010)	0.214** (0.016-0.170)	1 (0.537-2.081)	-0.042 (-0.497-0.022)	-0.168** (-0.136-0.131)	0.113*** (-0.107-0.176)	0.301 (0.014-0.241)	0.77*** (1.626-2.530)	0.657*** ((0.246-1.102)
Lymphoedema	0.274*** (0.008-0.038)	0.225** (0.001-0.077)	0.042 (-0.119-0.005)	1 (0.135-0.897)	0.103 (-0.035-0.096)	0.118 (-0.072-0.067)	-0.038 (-0.087-0.025)	0.036 (-0.083-0.428)	0.042 (-0.133-0.294)
Peripheral Neuropathy	0.195** (-0.025-0.036)	0.098 (-0.046-0.104)	0.168 (-0.125-0.120)	0.103 (-0.133-0.368)	1 (1.518-2.924)	0.343*** (0.158-0.419)	-0.044 (-0.092-0.128)	-0.206** (-0.767-0.238)	-0.214** (-0.608-0.229)
Menopausal Symptoms	0.379*** (0.039-0.093)	0.189** (-0.40-0.101)	0.113 (-0.087-0.144)	0.118 (-0.245-0.228)	0.343*** (0.140-0.372)	1 (-0.076-1.344)	-0.075 (-0.187-0.019)	-0.139* (-0.374-0.575)	-0.178** (-0.722-0.064)
Sexual Worry	0.087 (0.010-0.079)	0.109 (-0.087-0.087)	0.301*** (0.017-0.300)	-0.038 (-0.454-0.129)	-0.044 (-0.124-0.174)	-0.075 (-0.285-0.029)	1 (-0.189-1.567)	0.289*** (0.066-1.226)	0.176*** (-0.856-0.105)
Sexual Activity	-0.114* (-0.013-0.002)	0.188** (-0.011-0.027)	0.77*** (0.097-0.151)	0.036 (-0.021-0.106)	-0.206** (-0.05-0.015)	-0.139* (-0.027-0.042)	0.289*** (0.003-0.058)	1 (-0.095-0.290)	0.756*** (0.333-0.516)
Sexual Enjoyment	-0.095 (-0.006-0.013)	0.141* (-0.026-0.020)	0.657*** (0.021-0.095)	0.042 (-0.048-0.105)	-0.214** (-0.057-0.021)	-0.178** (-0.076-0.007)	0.176** (-0.060-0.007)	0.756*** (0.480-0.745)	1 (0.060-0.517)

***, p<0.001; **, p<0.01; *, p<0.05

Berdasarkan Tabel 4, didapatkan bahwa subscale *symptom experience* berhubungan positif secara signifikan dengan subscale Menopausal Symptoms, Lymphoedema, Peripheral Neuropathy, dan Body Image. Subscale body image berhubungan positif secara signifikan dengan subscale Symptom Experience, Sexual/Vaginal Functioning, Lymphoedema, Menopausal Symptoms, Sexual Activity, dan Sexual Enjoyment. Subscale Sexual/Vaginal Functioning berhubungan positif secara signifikan dengan subscale Body Image, Sexual Activity, dan Sexual Enjoyment, namun berhubungan negative dengan Peripheral Neuropathy dan Menopausal Symptoms. Subscale Lymphoedema berhubungan positif secara signifikan dengan subscale Symptom Experience dan Body Image. Subscale Peripheral Neuropathy berhubungan positif secara signifikan dengan subscale Symptom Experience dan Menopausal Symptoms, namun berhubungan negative dengan Sexual Activity dan

Sexual Enjoyment. Subscale Menopausal Symptoms berhubungan positif secara signifikan dengan subscale Symptom Experience, Body Image, dan Peripheral Neuropathy, namun berhubungan negative dengan Sexual Activity dan Sexual Enjoyment. Subscale Sexual Worry berhubungan positif secara signifikan dengan subscale Sexual/Vaginal Functioning, Sexual Activity, dan Sexual Enjoyment. Subscale Sexual Activity berhubungan positif secara signifikan dengan subscale Body Image, Sexual/Vaginal Functioning, Sexual Worry, dan Sexual Enjoyment, namun berhubungan negative dengan Symptom Experience, Peripheral Neuropathy, dan Menopausal Symptoms.

Table 5. Reliability of EORTC QLQ BR45 Indonesian version among Cervical Cancer Patients

Domains	Mean (SD)	Cornbach's alpha	95% CI
Functioning scales			
Body Image	1.43 (0.77)		
Sexual Functioning	1.77 (0.95)		
Sexual enjoyment	1.78 (1.00)	0.687	0.648-0.723
Future perspective	1.85 (1.09)		
Breast satisfaction	3.34 (1.04)		
Symptoms scales/item			
Systemic therapy side effects	1.88 (1.14)		
Breast symptoms	1.85 (1.01)	0.82	0.798-0.840
Arm symptoms	1.80 (1.07)		
Upset by hair loss	1.60 (0.99)		
Target symptom scale			
Endocrine therapy scale	1.48 (0.99)		
Endocrine sexual scale	1.25 (0.79)	0.808	0.785-0.829
Skin/mucosis scale	1.31 (0.93)		

Table 6. Reliability of EORTC QLQ CX24 Indonesian version among Cervical Cancer Patients

Domains	Mean (SD)	Cornbach's alpha	95% CI
Symptom Experience	1.76 (1.11)	0.734	0.681-0.780
Body Image	1.44 (0.80)	0.92	0.901-0.936
Sexual/Vaginal Functioning	1.17 (0.52)	0.944	0.931-0.954
Lymphoedema	1.18 (0.61)	0.109	0.146-0.306
Peripheral Neuropathy	2.77 (1.23)	0.147	0.096-0.336
Menopausal Symptoms	2.42 (1.22)	0.266	0.051-0.429
Sexual Worry	2.18 (1.41)	0.077	0.187-0.282
Sexual Activity	1.21 (0.54)	0.043	0.340-0.189
Sexual Enjoyment	1.20 (0.54)	0.036	0.332-0.194

Table 7. Standardized factor loading of the EORTC QLQ-BR45

Domains	Items	Functioning Scales	Symptoms Scales	Target Symptom Scales
Functioning Scales (10 items)				
BI 39	Have you felt physically less attractive as a result of your disease or treatment?	0.889		
BI 40	Have you felt physically less feminine as a result of your disease or treatment?	0.888		
BI 41	Have you felt physically less feminine as a result of your disease or treatment?	0.881		
BI 42	Have you been dissatisfied with your body?	0.858		
SX 44	Have you been interested in sex?	0.295		
SX 45	Have you been sexually active (with or without intercourse)?	0.283		
SE 46	Has sex been enjoyable for you?	0.229		
FU 43	Have you worried about your health in the future?	0.604		
BS 74	Have you been satisfied with the cosmetic result of the surgery?	0.077		
BS 75	Have you been satisfied with the appearance of the skin of your affected breast (thoracic area)?	0.072		
Symptoms scales (16 items)				
SYS 31	Have you had a dry mouth?		0.638	
SYS 32	Have food and drink tasted different than usual?		0.735	
SYS 33	Have your eyes been painful, irritated or watery?		0.476	
SYS 34	Have you lost any hair?		0.634	
SYS 36	Have you felt ill or unwell?		0.719	
SYS 37	Have you had hot flushes?		0.481	
SYS 38	Have you had headaches?		0.569	
BR 50	Have you had any pain in the area of your affected breast?		0.714	

BR 51	Has the area of your affected breast been swollen?		0.853	
BR 52	Has the area of your affected breast been oversensitive?		0.853	
BR 53	Have you had skin problems on or in the area of your affected breast (e.g., itchy, dry, flky)?		0.595	
ARM 47	Have you had any pain in your arm or shoulder?		0.649	
ARM 48	Have you had a swollen arm or hand?		0.523	
ARM 49	Have you had problems raising your arm or moving it sideways?		0.685	
HU 35	Have you been upset by the loss of your hair?		0.454	
Target Symptom Scale (22 items)				
ET 54	Have you sweated excessively?			0.130
ET 55	Have you had mood swings?			0.292
ET 56	Have you been dizzy?			0.336
ET 63	Have you had problem with your joints?			0.832
ET 64	Have you had stiffness in your joints?			0.837
ET 65	Have you had pain in your joints?			0.831
ET 66	Have you had aches or pains in your bones?			0.837
ET 67	Have you had aches or pains in your muscles?			0.785
ET 68	Have you gained weight?			0.143
ET 69	Has weight gain been a problem for you?			0.199
ES 70	Have you had a dry vagina?			0.820
ES 71	Have you had discomfort in your vagina?			0.833
ES 72	Have you had pain in your vagina during sexual activity?			0.745
ES 73	Have you experienced a dry vagina during sexual activity?			0.801
SM 57	Have you had soreness in your mouth?			0.367
SM 58	Have you had any reddening in your mouth?			0.274
SM 59	Have you had pain in your hands or feet?			0.642
SM 60	Have you had any reddening on your hands or feet?			0.410
SM 61	Have you had tringling in your fingers or toes?			0.449
SM 62	Have you had numbness in your fingers or toes?			0.571

Table 8. Standarized factor loading of the EORTC QLQ-CX24

Domains	Items	SE	BI	SF	Ly	PN	MS	SW	SA	SEJ
Symptom Experience (11 items)										
SE 31	Have you had cramps in your abdomen?	0.460								
SE 32	Have you had difficulty in controlling your bowels?	0.556								
SE 33	Have you had blood in your stools (motions)?	0.386								
SE 34	Did you pass water/urine frequently?	0.515								
SE 35	Have you had pain or burning feeling when passing water/urinating?	0.747								
SE 36	Have you had leaking of urine?	0.689								
SE 37	Have you had difficulty emptying your bladder?	0.652								
SE 39	Have you had pain in your lower back?	0.425								
SE 41	Have you had irritation or soreness in your vagina or vulva?	0.335								
SE 42	Have you had discharge from your vagina?	0.077								
SE 43	Have you had abnormal bleeding from your vagina?	0.330								
Body Image (3 items)										
BI 45	Have you felt physically less attractive as a result of your disease or treatment?		0.372							
BI 46	Have you felt less feminine as a result of your disease or treatment?		0.432							
BI 47	Have you felt dissatisfied with your body?		0.276							
Sexual/Vaginal Functioning (4 items)										
SV 50	Has your vagina felt dry during sexual			0.85						

Dalam validasi konstruk dalam penelitian ini, kami menguji struktur EORTC QLQ BR 45 dan EORTC QLQ CX24 versi Indonesia yang diidentifikasi instrument dari EORTC dari eropa serta membangun model instrument EORTC QLQ BR 45 dan EORTC QLQ CX24 versi Indonesia. Berdasarkan hasil analisis *construct validity*, penelitian ini menunjukkan bahwa semua subskala EORTC QLQ BR 45 dan EORTC QLQ CX24 versi Indonesia memadai untuk dilakukan analisis faktor dan cukup efektif dalam membedakan antara mereka yang memiliki mempunyai persepsi positif dalam menjalani kehidupan di masa mendatang dan negative setelah didiagnosis kanker. Persepsi pasien yang menderita penyakit krosis seperti kanker sangat signifikan berpengaruh pada aspek kesehatan fungsional serta peningkatan kualitas hidup mereka [11].

Dalam hal internal consistency reliability dari EORTC QLQ BR 45 dan EORTC QLQ CX24 dan sub domainnya, hasil penelitian menunjukkan sangat kuat dari meskipun keandalan konsistensi internal dan subskalanya, yaitu Lymphoedema, Peripheral Neuropathy, Menopausal Symptoms Sexual Worry, Sexual Enjoyment dan Sexual Activity. Hal ini dimungkinkan karena pertanyaan dari item pembentuk instrument tersebut masih dianggap tabu untuk orang Indonesia [12] [13].

D. STATUS LUARAN: Tuliskan jenis, identitas dan status ketercapaian setiap luaran wajib dan luaran tambahan (jika ada) yang dijanjikan. Jenis luaran dapat berupa publikasi, perolehan kekayaan intelektual, hasil pengujian atau luaran lainnya yang telah dijanjikan pada proposal. Uraian status luaran harus didukung dengan bukti kemajuan ketercapaian luaran sesuai dengan luaran yang dijanjikan. Lengkapi isian jenis luaran yang dijanjikan serta mengunggah bukti dokumen ketercapaian luaran wajib dan luaran tambahan melalui Simlitabmas.

Status luaran

Jenis luaran	Status	Keterangan
Luaran Wajib Terlampir (lampiran 1)	<i>accepted</i>	Open Access Macedonian Journal of Medical Sciences (SJR=0,288), dan Q3) Link journal: https://oamjms.eu/index.php/mjms Link indexing: https://www.scopus.com/sourceid/21100824403
Luaran tambahan Terlampir (lampiran 2)	In review	1. Asian Pacific Journal of cancer prevention (SJR=0,512) Link journal: http://journal.waocp.org/journal/indexing Link indexing: https://www.scopus.com/sourceid/40173 2. Prosiding seminar internasional UPHEC 2021

E. PERAN MITRA: Tuliskan realisasi kerjasama dan kontribusi Mitra baik *in-kind* maupun *in-cash* (untuk Penelitian Terapan, Penelitian Pengembangan, PTUPT, PPUPT serta KRUP). Bukti pendukung realisasi kerjasama dan realisasi kontribusi mitra dilaporkan sesuai dengan kondisi yang sebenarnya. Bukti dokumen realisasi kerjasama dengan Mitra diunggah melalui Simlitabmas.

Penelitian dasar jadi tidak menggunakan mitra.

F. KENDALA PELAKSANAAN PENELITIAN: Tuliskan kesulitan atau hambatan yang dihadapi selama melakukan penelitian dan mencapai luaran yang dijanjikan, termasuk penjelasan jika pelaksanaan penelitian dan luaran penelitian tidak sesuai dengan yang direncanakan atau dijanjikan.

KENDALA PELAKSANAAN PENELITIAN

1. Proses selama melakukan perijinan penelitian di rumah sakit, dikarenakan pandemic Covid-19 dan kebijakan PPKM maka peneliti dibatasi dalam pengambilan data di lokasi penelitian.
2. Luaran penelitian tambahan yang dijanjikan dalam proposal adalah jurnal nasioanal terakreditasi, namun peneliti merasa bahwa manuscript ini layak untuk terbit di jurnal bereputasi, akhirnya di submit di Asian

Pacific Journal of cancer prevention (SJR=0,512), namun sampai saat ini masih tahap in review. Oleh karena itu peneliti sudah menyiapkan draft manuscript bagian dari penelitian ini, namun baru terselesaikan sampai dengan tahap hasil di draft manuscript yang ketiga tersebut.

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G. RENCANA TAHAPAN SELANJUTNYA: Tuliskan dan uraikan rencana penelitian di tahun berikutnya berdasarkan indikator luaran yang telah dicapai, rencana realisasi luaran wajib yang dijanjikan dan tambahan (jika ada) di tahun berikutnya serta *roadmap* penelitian keseluruhan. Pada bagian ini diperbolehkan untuk melengkapi penjelasan dari setiap tahapan dalam metoda yang akan direncanakan termasuk jadwal berkaitan dengan strategi untuk mencapai luaran seperti yang telah dijanjikan dalam proposal. Jika diperlukan, penjelasan dapat juga dilengkapi dengan gambar, tabel, diagram, serta pustaka yang relevan. Jika laporan kemajuan merupakan laporan pelaksanaan tahun terakhir, pada bagian ini dapat dituliskan rencana penyelesaian target yang belum tercapai.

RENCANA TAHAPAN SELANJUTNYA

Latar belakang: Kuisioner kualitas hidup yang paling banyak digunakan dalam penelitian kanker payudara dan kanker serviks adalah EORTC QLQ-BR45 dan EORTC QLQ-CX24 (*European Organization for Research and Treatment Quality of Life Questionnaire BR45 dan CX24*) [14]. EORTC QLQ-BR45 dan CX24 merupakan kuisioner spesifik yang digunakan pada pasien kanker payudara dan kanker serviks. Kuisioner ini EORTC QLQ-BR45 terdiri dari 48 item yang menilai skala spesifik berbagai aspek kualitas hidup yang terdiri dari lima skala fungsional (fungsi fisik, perseptiv masa depan, seksual, menikmati aktivitas seksual, dan emosional) dan tujuh skala gejala kanker payudara (efek samping terapi, rambut rontok, nyeri lengan, gejala payudara, efek gejala terapi hormone, masalah kulit, hormone seks). **Hasil penelitian saat ini, kuisioner ini telah diterjemahkan ke dalam Bahasa Indonesia dan divalidasi serta dapat digunakan pada populasi Indonesia terutama pada pasien kanker payudara dan kanker serviks.**

Masih tingginya angka prevalensi kanker payudara dan kanker serviks di Indonesia. Di Indonesia, rentang tahun 2013 – 2018, prevalensi kanker/tumor terjadi peningkatan sebesar 39%. Angka kejadian tertinggi pada kelompok laki-laki adalah kanker paru (19,4 per 100.000 penduduk, kematian 10,9/ 100.000 penduduk), sedangkan pada kelompok wanita, kanker payudara dan kanker leher rahim secara berurutan mendominasi angka kesakitan diantara mereka (42,1/100.000 penduduk dan 23,4/100.000 penduduk). Angka mortalitas karena kanker cukup tinggi, sebanyak 13,9 per 100.000 penduduk meninggal karena kanker. Selain itu penderita kanker biasanya juga menderita penyakit penyerta (kormobid). Penelitian di Amerika menyebutkan bahwa empat dari 10 penderita kanker dilaporkan menderita kormobid dan penyakit kronis lain, dan 15 % dari penderita kanker tersebut menderita dua atau lebih penyakit kronis, seperti penyakit kardiovaskuler, obesitas dan gangguan metabolic (contohnya diabetes melitus), masalah kesehatan mental (depresi) dan kondisi musculoskeletal [15] [16]. Kondisi demikian menyebabkan penderita kanker mengalami pengobatan dan terapi yang panjang serta kompleks yang berpengaruh pada kualitas hidup mereka [17]. Selain itu, **Pandemi Covid-19** telah berdampak besar bagi pelayanan dan perawatan kesehatan termasuk kanker di seluruh dunia, termasuk di Indonesia [18] [19]. Data awal menunjukkan risiko morbiditas dan mortalitas Covid-19 bagi keberlangsungan hidup survivor kanker [20]. Sistem pelayanan kesehatan hampir disemua negara mengalami perubahan dan lebih fokus untuk mengatasi Covid-19 sehingga penyakit lain termasuk kanker menjadi terdampak (lebih memprioritaskan Covid-19) [21] [22] [23]. Dengan telah tervalidasinya instrument kualitas hidup EORTC QLQ-BR45 dan EORTC QLQ-CX24 dari penelitian ini, perlu dilakukan penelitian selanjutnya untuk mengeksplorasi instrument yang sudah tervalidasi versi Indonesia ini dalam mengukur kualitas hidup pasien. Pengukuran kualitas hidup pada pasien kanker payudara penting untuk dilakukan karena dapat mempengaruhi pengambilan keputusan dalam terapi sampai dengan kepatuhan pasien dalam menjalani terapi.

Oleh karena itu **tujuan dari penelitian tahun selanjutnya** adalah untuk mengukur kualitas hidup pasien kanker payudara dan kanker setviks dengan menggunakan instrument yang sudah tervalidasi.

Urgensi dari penelitian tahun selanjutnya adalah hasil penelitian ini sangat diperlukan untuk membantu tenaga medis dan paramedis serta penentu kebijakan untuk meningkatkan usia harapan hidup pasien kanker secara umum dan khususnya pasien kanker payudara dan kanker serviks.

Tinjauan Pustaka

Berdasarkan data *World Health Organization* (WHO) disebutkan bahwa kanker merupakan masalah kesehatan masyarakat secara global dan diestimasikan sekitar 9,6 juta orang meninggal karena kanker pada tahun 2018. Secara global sekitar 1 diantara 6 penderita meninggal karena kanker. Angka mortalitas kanker ini hampir 70% ditemui di negara-negara berkembang terutama di negara *low and middle-income countries* [24].

Upaya pencegahan kanker perlu dilakukan sedini mungkin, karena banyak pasien kanker didiagnosis dalam stadium lanjut terutama ditemukan pada pasien-pasien kanker di negara berkembang seperti di Indonesia [25] [26] [27]. Penelitian sebelumnya menyebutkan bahwa pasien kanker yang didiagnosis lanjut dapat berakibat pada keberlangsungan hidup yang rendah. Namun karena rendahnya pengetahuan mereka tentang tanda dan gejala kanker termasuk di Indonesia [28]. Selain itu stigma terkait dengan kanker menjadikan para penderita kanker terlambat melakukan pemeriksaan skrining[29] .

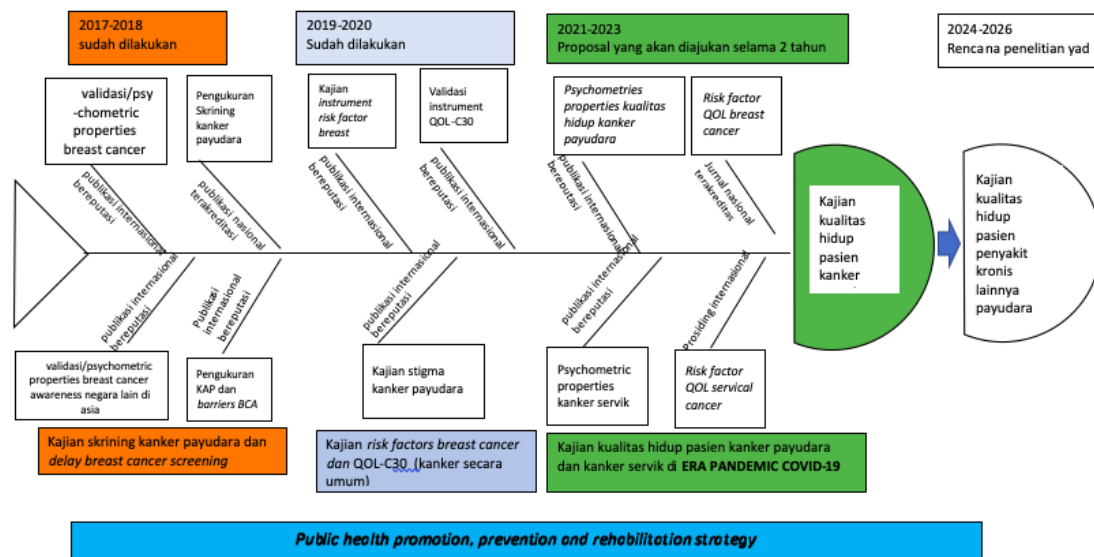
Berdasarkan WHO, kualitas hidup diartikan sebagai persepsi individu tentang kehidupan, nilai tujuan, standar, dan kepentingan dalam konteks budaya dari mana pasien tersebut berasal. Kualitas hidup juga suatu terminologi yang menunjukkan tentang kesehatan fisik, sosial dan emosi seseorang serta kemampuannya untuk melaksanakan tugas sehari-hari. Bagi penderita kanker, beban psikis saat didiagnosis pertama kali, dukungan keluarga, tanda dan gejala serta pengobatan yang lama dan panjang dan menyakitkan bagi pasien merupakan sejumlah faktor yang mempengaruhi kualitas hidup pasien kanker[30].

Kualitas hidup pasien kanker terutama kanker payudara dan kanker servik akan dapat diukur dengan baik apabila instrumen yang digunakan juga reliabel dan sesuai dengan *culture* dan budaya masyarakat setempat. *European Organization for Research and Treatment of Cancer (EORTC)* adalah organisasi Eropa yang telah banyak membuat instrumen kualitas hidup khususnya kanker termasuk kanker payudara (EORTC QOL-BR45) dan kanker servik (EORTC QOL-CX24). Penelitian sebelumnya memang telah melakukan validasi instrumen kualitas kanker secara umum (EORTC QOL-C30) di banyak negara khususnya di Eropa, [31] [32] [33] termasuk Indonesia [34]. Meskipun instrumen-instrumen kanker baik EORTC QLQ-BR45 dan instrumen EORTC QLQ-CX24 telah tervalidasi di Eropa, namun aplikasi di negara lain sangat berbeda, karena budaya dan agama berperan besar dalam melakukan coping terhadap rasa sakit saat didiagnosis dan dampak psikologis bagi penderita [35].

Peta jalan penelitian

3. Peta jalan (road map) penelitian

Peta jalan penelitian ini untuk menggambarkan jalannya penelitian sebelumnya, penelitian saat ini, dan rencana penelitian kedepan.



Gambar 1. Peta jalan penelitian

Penjabaran	Tahun 2017-2018	Tahun 2019-2021	Tahun 2022-2023
Target	<ul style="list-style-type: none"> - Terpetakannya kerangka pemecahan masalah kanker (pengetahuan tentang tanda dan gejala kanker, pengetahuan factor risiko kanker, sikap, hambatan dan perilaku skrining kanker payudara - Terpetakannya hambatan skrining kanker di Indonesia yang menyebabkan <i>delay screening</i> sehingga banyak 	<ul style="list-style-type: none"> - Penemuan model intrumen secara komprehensif dan tahapan-tahapan operasionalnya - Kajian kualitatif untuk melihat fenomena penyebab <i>delay breast cancer screening</i> yang menyebabkan banyak pasien didiagnosis stadium lanjut dan menyebabkan <i>poor prognosis</i> 	<ul style="list-style-type: none"> - Validasi <i>psychometric properties</i> kualitas hidup kanker payudara dan kanker servik - Penyempurnaan model intrumen kualitas hidup kanker payudara dan kanker servik dan tahap-tahap operasionalisasinya di kota besar (dengan budaya yang lebih majemuk)

	pasien didiagnosis dalam stadium lanjut	- Validasi instrumen kualitas hidup kanker umum (EORTC QOL-C30)	
Sasaran	Pemecahan masalah sesuai dengan karakteristik masyarakat dan daerah setempat untuk segala jenis kanker payudara	Model prediksi penilaian risiko kanker sesuai dengan karakteristik dan daerah setempat dan kajian kualitatif stigma kanker	Model instrumen yang komprehensif yang dapat dioperasionalkan di berbagai daerah
Rincian program	Riset aksi tentang pemecahan masalah kanker dari segala jenis kanker	Penemuan model instrumen sesuai dengan karakteristik masyarakat setempat	Penemuan model instrumen sesuai dengan karakteristik masyarakat setempat
Output	Publikasi di jurnal internasional bereputasi (4 artikel) (Solikhah, dkk.dari tahun 2015-2017) dan satu artikel di jurnal nasional terakreditasi sinta 2 (Solikhah, dkk, 2018)	Publikasi internasional bereputasi sebanyak 3 artikel	Pada tahun 2022, akan mempublikasikan di jurnal bereputasi yaitu di: - PlosONE , ISSN: 1932-6203, SJR= 0,99 - Serta artikel tambahan di jurnal terakreditasi nasional di Disease prevention and Public health journal

Metode penelitian

1. Desain Penelitian

Penelitian ini merupakan penelitian kasus mix-method yang bertujuan untuk menguji instrumen adopsi dan eksplorasi untuk pengujian *psychometric properties* instrumen kualitas hidup pasien kanker, pasien kanker payudara dan kanker servik (**Gambar 2. Diagram alir penelitian**) serta pembuatan naskah akademik untuk pengukuran kualitas hidup pasien kanker payudara dan kanker serviks.

2. Populasi, sampel dan teknik sampling

Populasi dalam penelitian ini adalah pasien kanker payudara dan kanker servik di Bagian onkologi (Bagian penyakit kanker) di Rumah Sakit Karyadi dan RS Muwardi. Sampelnya adalah pasien kanker payudara dan kanker servik. Besar sampel dalam penelitian ini didasarkan pada analisis faktor yang akan digunakan untuk membangun validitas konstruk. Analisis faktor adalah teknik yang membutuhkan ukuran sampel yang lebih besar, namun tidak ada pendekatan perhitungan ukuran sampel formal untuk metode ini. Berdasarkan Comrey dan Lee (1992) direkomendasikan ukuran sampel di mana 50-sangat tidak baik, 100-tidak baik, 200-300- baik, 500-sangat baik, dan 1000 sangat baik [36]. Oleh karena itu, total ukuran sampel untuk penelitian ini akan setidaknya 300 responden (300 kanker payudara dan 300 kanker serviks). sementara itu untuk pembuatan naskah akademik untuk instrument kualitas hidup kanker payudara dan kanker serviks, maka akan mengundang stake holder terkait dengan menggunakan metode *focus group discussion* (FGD).

3. Teknik sampling

Teknik pengambilan sampel untuk penelitian ini adalah *purposive sampling*. Adapun criteria dari sampel sebagai berikut; Kriteria inklusi terdiri dari (1) pasien kanker payudara dan kanker servik berusia ≥ 18 tahun; (2) responden yang melek huruf; (3) bersedia berpartisipasi dalam penelitian ini. Kriteria eksklusi terdiri dari (1) wanita yang sedang hamil atau sedang program hamil, (2) wanita yang sedang menyusui. Selanjutnya pasien akan diberikan dan menandatangani *informed consent* sebagai bentuk persetujuan tertulis untuk terlibat dalam penelitian ini. Untuk sampling FGD menggunakan *purposive sampling*.

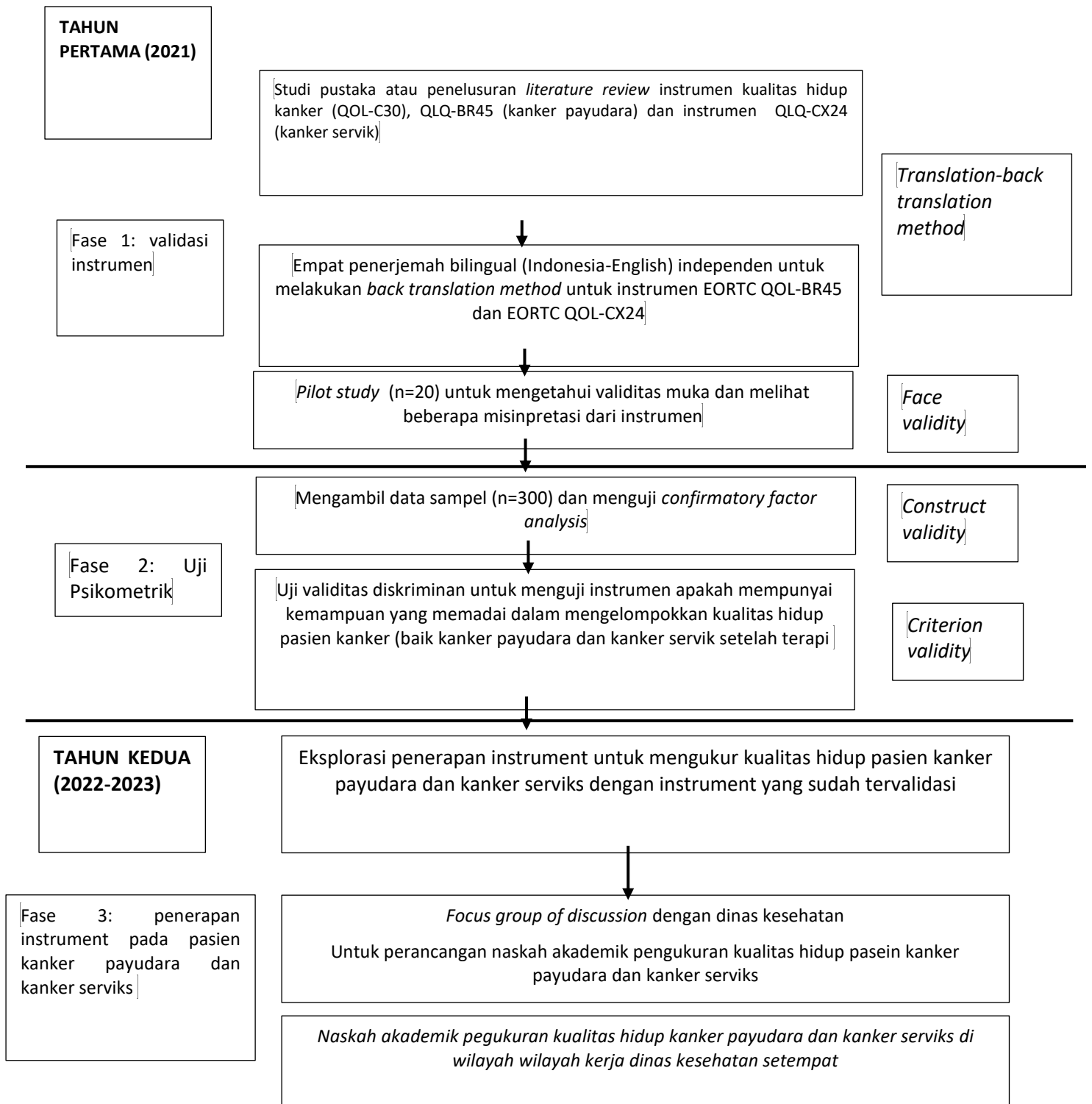
4. Analisa data

Pertama, statistik deskriptif akan digunakan untuk mengukur frekuensi dan persentase untuk variabel kategori, standar deviasi atau median untuk variabel kontinyu sesuai dengan distribusi dari data. Ordinal regression logistic model akan digunakan untuk mengeksplorasi prosentase domain pembangun instrument kanker payudara (EORTC QOL-BR45) dan kanker servik (EORTC QOL-CX24). Semua analisis akan dilakukan dengan menggunakan program R.

5. Luaran penelitian

Jenis luaran	Status	Keterangan
Luaran Wajib	<i>accepted</i>	PlosONE , ISSN: 1932-6203, SJR= 0,99 Link journal: Link indexing: https://www.scopus.com/sourceid/10600153309

Luaran tambahan	accepted	Disease prevention and Public health journal (formally known: Kesmas: Jurnal Fakultas Kesehatan Masyarakat), sinta 3 Link: http://journal2.uad.ac.id/index.php/dpphj
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Gambar 2. Diagram alir penelitian

6. Tugas pengusul dan Jadwal penelitian

Tahun ke-2 (2022-2023)

TAHUN KE-2 (2022-2023)			
No	Kegiatan	Dr. Solikhah	Prof.Dr. Dyah Perwitasari, MSi, Ph.D
1	Persiapan menguji coba instrumen yang berbahasa Indonesia ke wilayah lain di luar propinsi Yogyakarta		
	Pembuatan dan pendaftaran hasil komite etik penelitian di RS Dharmais Jakarta	v	v
	Meeting dan FGD dengan kepala bagian kanker di RS Dharmais	v	v
	Penelusuran <i>literature review</i> untuk kualitas hidup pasien kanker (kanker payudara/kanker servik/instrumen kanker umum)	v	v
	Pembelian artikel yang berbayar dan	v	v
	Persiapan kuesioner elektronik yang bebas dari bias	v	v
	Rekrutmen dan pelatihan enumerator	v	v
	Pendaftaran etik untuk protocol sistematik review	v	v
	Penulisan artikel untuk literature review (artikel pertama)	v	v
	Memperbaiki respon dari reviewer	v	v
2	Pengambilan data		
	<i>Collecting the data</i> ke RS Dharmais	v	
	<i>Cleaning data</i>	v	
	<i>Entry and analysis data</i>	v	v
3	Mengikuti seminar internasional		
	Penulisan artikel untuk hasil penelitian	v	v
	Memperbaiki respon dari reviewer	v	v
4	Pembuatan laporan penelitian		
	Penyusunan laporan penelitian	v	v
	Pembuatan laporan kemajuan penelitian	v	v
	Mengikuti monitoring dan evaluasi internal	v	v
	Mengikuti monitoring dan evaluasi eksternal	v	v
	Pembuatan laporan kemajuan	v	v
	Pembuatan laporan akhir penelitian	v	v
	Penyusunan laporan penelitian	v	v

Jadwal kegiatan tahun ke dua

No	Nama Kegiatan	Bulan							
		1	2	3	4	5	6	7	8
	Persiapan menguji coba instrumen yang berbahasa Indonesia ke wilayah lain di luar propinsi Yogyakarta	x	x						
	Pembuatan dan pendaftaran hasil komite etik penelitian di RS		x	x	x				
	Meeting dan FGD dengan kepala bagian kanker di RS				x				
	Penelusuran <i>literature review</i> untuk kualitas hidup pasien kanker (kanker payudara/kanker servik/instrumen kanker umum)	x	x	x					
	Pembelian artikel yang berbayar dan pembelian bahan habis pakai			x					
	Persiapan kuesioner elektronik yang bebas dari bias			x					
	Rekrutmen dan pelatihan enumerator				x	x			
	Pendaftaran etik untuk protocol sistematik review				x	x			
	Penulisan artikel untuk literature review (artikel pertama)				x	x	x		
	Memperbaiki respon dari reviewer							x	
	<i>Collecting the data</i>					x			

No	Nama Kegiatan	Bulan							
		1	2	3	4	5	6	7	8
	<i>Cleaning data</i>					x			
	<i>Entry and analysis data</i>					x	x		
	Persiapan dan mengikuti seminar internasional					x	x		
	Penulisan artikel untuk hasil penelitian						x		
	Memperbaiki respon dari reviewer							x	
	Pembuatan laporan penelitian						x		
	Penyusunan laporan penelitian							x	
	Pembuatan laporan kemajuan penelitian							x	
	Mengikuti monitoring dan evaluasi internal								x
	Mengikuti monitoring dan evaluasi eksternal								x
	Pembuatan laporan kemajuan								x
	Pembuatan laporan akhir penelitian								x

H. DAFTAR PUSTAKA: Penyusunan Daftar Pustaka berdasarkan sistem nomor sesuai dengan urutan pengutipan. Hanya pustaka yang disitasi pada laporan kemajuan yang dicantumkan dalam Daftar Pustaka.

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Dokumen pendukung luaran Wajib #1

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Target: Accepted

Dicapai: Accepted

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2. Surat keterangan accepted dari editor

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Judul artikel: Diet, obesity and sedentary lifestyle as risk factor of breast cancer among women at Yogyakarta Province in Indonesia:

Title: Diet, obesity and sedentary lifestyle as risk factor of breast cancer among women at Yogyakarta Province in Indonesia

Abstract

BACKGROUND: Breast cancer prevalence remains high worldwide, including in Indonesia. Studies examining relationship between obesity, dietary habit, sedentary lifestyle, and breast cancer development are largely inconclusive.

AIM: This study aimed to determine relationship between obesity, dietary habit, sedentary lifestyle, and breast cancer risk among women at Yogyakarta Province in Indonesia.

METHODS: This was a cross-sectional study on 135 women selected purposively during March– May 2019. Binary logistic regression models were employed in the analysis with 0.05 considered significant.

RESULTS: Among study subjects, 54.07% and 40% were, respectively, ≥ 40 years old and smokers. About 53.33% consumed preserved food 3-6 times/week, and 49% and 50.37% consumed sweet food and beverage >1 time/day, respectively. High BMI and physical inactivity were associated with 93% and 85% breast cancer risk reductions (AOR:0.07, 95%CI: 0.01–0.45, $p<0.01$ and AOR:0.15, 95%CI: 0.05–0.47, $p<0.001$). Smoking showed no significant relationship. A waist circumference of ≤ 80 was linked to 78% breast cancer risk reduction. Sweet food, sweet beverage, and energy drink consumption of >1 time/day led to 96%, 36% and 84% reductions of invasive breast cancer risks. Meanwhile, consumption of preserved food 3-6 times per weeks and soft drinks >1 time/day correlated with an increased risk of breast cancer.

CONCLUSION: High BMI, physical inactivity, and lower waist circumference were associated with lower breast cancer risk, while preserved food and soft drink consumption significantly increase the risk. Although sedentary lifestyle seems to have a small protective effect, healthy lifestyle should be encouraged and effective strategies are required to encourage women to adopt healthy lifestyle.

Keywords: Breast cancer, obesity, diet, sedentary lifestyle, Indonesian women

Introduction

Breast cancer is known as the deadliest form of cancer with increasing incidence around the world. Almost half of the breast cancer cases and more than half of deaths due to cancer occur in Asian countries where almost 60% of the world population lives [1]. In women, breast cancer is the most frequently diagnosed cancer and the leading cause of death globally, including in Indonesia. Data from the Ministry of Health of the Republic of Indonesia (2019) demonstrated that the majority of breast cancer patients in Indonesia are diagnosed at an advanced stage. Therefore, it is not surprising that breast cancer ranks first among all cancers in women with 13.9 deaths per 100,000 population. The Indonesian government through the Ministry of Health of the Republic of Indonesia has propagated *Germas* (*Gerakan Masyarakat Hidup Sehat*, Healthy Living Community Movement) to instill active and healthy lifestyle by doing physical activities, eating more vegetables and fruit, avoiding smoking, not drinking alcohol, and having regular health checks to reduce non-communicable disease incidence, including for breast cancer. However, the incidence of breast cancer still increases from 1.4 per

1,000 population in 2013 to 1.79 per 1,000 population in 2018, with a mortality rate of 17 per 100,000 population.

This high incidence and mortality rate of breast cancer are not solely related to genetic profiling tendencies as 90-95% of the cases are linked to a number of modifiable risk factors related to lifestyle, such as physical inactivity, smoking habit, alcohol consumption, unhealthy eating patterns, and obesity [2], [3], [4]. A large body of evidence has mentioned the role of body mass index (BMI) in cancer and that weight gain in breast cancer patients may complicate the detection of breast cancer and influence patient's response to breast cancer treatment. Previous studies reported that obesity does not only cause endocrine system disorders, but also causes insulin resistance [5], [6] and significantly increases inflammatory breast cancer [7].

Obesity has also been associated with reduced breast cancer survival [8]. A physically active lifestyle, in comparison with inactive lifestyle, has been shown to positively reduce the risk of breast cancer in several studies [9], [10]. In contrast, unhealthy eating habit such as consuming high-sugar drinks, foods containing saturated fat, and red/processed meat have been shown to increase the risk of breast cancer [11]. However, the relationship between physical activity and the incidence of breast cancer is still debatable [10]. Also, whether the habit of consuming fatty food will affect the development of tumor cells in the breast or not still remains a controversy [12], [13]. Moreover, several previous studies revealed that, in women, BMI is inversely associated with an increase in breast cancer [14], [15], [16]. Hence, this study sought to examine the associations between obesity, diet, sedentary lifestyle, and breast cancer at Yogyakarta, Indonesia.

Methods

Study design and participants

This cross-sectional study was conducted after obtaining approval from the Ethics committee on Human Research of Ahmad Dahlan University (011903016). Written informed consent was obtained from all subjects prior to interview. This study involved 135 subjects who were diagnosed to have breast cancer treated at the PKU Muhammadiyah Yogyakarta hospital which specializes in oncology and cancer treatment. We have selected the province of Yogyakarta based on cancer data by the Indonesian Ministry of health in 2020, which had the highest cancer incidence rate compared to any other province in Indonesia. The inclusion criteria for participation were ≥ 18 years old, Indonesian, and able to communicate verbally. The exclusion criteria were designed to avoid those with diabetes mellitus, liver and renal diseases, and rheumatoid arthritis because this disease condition may require adherence to "special diet", which may interfere with the apparent effects of the dietary pattern studied and result in unwillingness to be interviewed.

Data measurement process

Lifestyle was measured based on previous research, in which regular exercise, absence of smoking habit, body mass index (BMI), waist circumference (WC), and a healthy diet were used as indicators of healthy lifestyles. Poor lifestyle is said to trigger high morbidity and mortality of diseases, including breast cancer [17], [18]. In this study, physical activity was measured using the Global Physical Activity Questionnaire (GPAQ) through interviews that collected information on the participants' physical activity during the past week. Rigorous

physical activity was defined as doing physical activities at least 3 days in the past week with a total activity duration of at least 1,500 metabolic equivalent of task (MET) minutes. MET minutes of rigorous activity are the duration (minutes) of activity in a week times eight calories. Moderate activity was defined as activities such as sweeping, mopping, gardening, etc. for at least 5 days with a total duration of 150 minutes in the previous week. Subsequently, the participants who performed rigorous activities and/or moderate activities were categorized into adequately active. Participants who did physical activities but did not fall into rigorous activity and moderate activity categories were classified as physically inactive.

The anthropometric measurements were used to assess BMI and waist circumference. BMI was measured by a trained research assistant with the participants in a standing position without shoes and outer clothing. A digital scale (Camry brand) is used and its calibration was monitored regularly before use in this study. Body mass index (BMI) was calculated as weight (kg) divided by the square of height (m²), and categorized into four groups according to the standard for ASEAN people in the World Health Organization (WHO) guideline: underweight (less than 18.5 kg/m²), normal weight (18.5 to 24.99 kg/m²), overweight (25.0 to 29.9 kg/m²), and obesity (30 kg/m² or greater) [19].

Waist circumference (WC) measurement was conducted by referring to WHO steps protocol where the measurement is made at the approximate midpoint between the lower margin of the last palpable rib and the top of the iliac crest using a stretch-resistant tape that provides a constant 100 g tension. The participants were asked to be relaxed and breathe out gently during the measurement. Also, they were asked to stand with feet close together, arms at the side, body weight evenly distributed, and wear fewer clothing. The tape was held firmly in the horizontal position and the measurement was repeated twice. If the measurements were within 1 cm of one another, the average should be calculated. If the difference between the two measurements exceeded 1 cm, the two measurements should be repeated. Based on the WHO cut-off points and risk of breast cancer incidence. WC are categorized into 1) high risk of breast cancer (> 80 cm) and 2) less risk of breast cancer (≤ 80 cm). Measurement of dietary habit of the participants was conducted using the Food Frequency Questionnaire (FFQ). Participants were asked about the average frequency of consuming one standard serving of specific food in three categories during the past month (1/day, 3-6/week, and <3/month). The responses on a frequency of consumption of a specific serving size for each item were converted into average daily intake. Subsequently, the consumption of daily foods was classified into sweet meals, sweet drinks, salty foods, fatty meals, roasted food, preserved food, seasoning, soft drinks, energy drinks, and instant noodle. Other variables were also asked to the participants, such as smoking (Yes/No), age, marital status, and occupation.

Statistical analysis

All statistical analyzes were performed using STATA version 13. Means and standard deviations were used to interpret continuous variables, while count and percentage were used to represent variables of categories. Multiple logistics regression was used to calculate adjusted odds ratio (AOR) and confidence intervals (95% CI) for evaluating associations between independent and dependent variables. Age, marital status, occupation, BMI, smoking, physical activity, and waist circumferences were assessed as potential confounders variables. Chi-

square was used to estimate the differences among categorical variables. The significance level was set at $p < 0.05$.

Results

The variable of participants' age in this research was divided into two: aged <40 (45.93%) and aged 40 years (54.07%). Of the total 135 participants, the majority of participants were married (76.30%) and 48.89% of them did not do physical activities. In details, the socio-demographic characteristics of the respondents are described in Table 1.

Table 1. Selected characteristics of participants study.

Participant characteristics	n	%
Age (years)		
<40	62	45.93
≥ 40	73	54.07
Marital status		
Single	27	20.00
Married	103	76.30
Widowed/separate/discovered	5	3.79
Occupation		
Unemployment	28	20.74
Labor	77	57.04
Government/official/business	30	22.22
BMI		
< 18.5	7	5.19
18.5 – 22.99	80	59.26
23 – 24.99	21	15.56
≥ 25	27	20.00
Smoking		
Yes	54	40.00
No	81	60.00
Physical activity		
Inactivity	66	48.89
Enough active	69	51.11
Waist circumference (centimeter)		
>80	84	62.22
≤ 80	51	37.78

More than half of the respondents (53.33%) consumed preserved food 3-6 times a week and 49% of the respondents consumed sweet food more than once per day. Sweet drinks were consumed more than once a day by 50.37% of the respondents. A more detailed description of the respondents' daily food consumption is listed in Table 2.

Table 2 The daily food consumption risk from study participants

The daily foods	n	%
Sweet meals		
>1 time per day	67	49.63

3-6 times per week	61	45.19
<3 times per month	7	5.19
<hr/>		
Sweet drinks		
>1 time per day	68	50.37
3-6 times per week	61	45.19
<3 times per month	6	4.44
<hr/>		
Salty foods		
>1 time per day	48	35.56
3-6 times per week	81	60.00
<3 times per month	6	4.44
<hr/>		
Fatty meals		
>1 time per day	45	33.33
3-6 times per week	83	61.48
< 3 times per month	7	5.19
<hr/>		
Roasted food		
>1 time per day	9	6.67
3-6 times per week	85	62.96
<3 times per month	41	30.37
<hr/>		
Preserved food		
>1 time per day	26	19.26
3-6 times per week	72	53.33
<3 times per month	37	27.41
<hr/>		
Seasoning		
>1 time per day	101	74.81
3-6 times per week	16	11.85
<3 times per month	18	13.33
<hr/>		
Soft drink		
>1 time per day	4	2.96
3-6 times per week	41	30.37
<3 times per month	90	66.67
<hr/>		
Energy drink		
>1 time per day	5	3.70
3-6 times per week	28	20.74
<3 times per month	102	75.56
<hr/>		
Instant noodle		
>1 time per day	4	2.96
3-6 times per week	51	37.78
<3 times per month	80	59.26

The unadjusted and adjusted odd ratios representing the relation between sedentary lifestyle and the breast cancer occurrence are shown in Table 3. After adjusting for other covariates, a higher BMI category was demonstrated to be significantly associated with increasing breast cancer incidence, with the odds of the risk for breast cancer decreased by 93% (AOR:0.07, 95%CI: 0.01 to 0.45, $p<0.01$). It was also demonstrated in this study that patients with the lack of physical activities had lower odd of developing breast cancer (AOR:0.15, 95%CI: 0.05 to 0.47, $p<0.001$). In contrast, smoking was shown to have no significant relationship with breast cancer incidence.

With regards to waist circumference, the odds of increasing of breast cancer risk for someone who had a waist circumference of more than 80 was 78% less than someone who had

a waist circumference of ≤ 80 (AOR:0.22, 95%CI: 0.75 to 0.65, $p<0.01$). In terms of age, respondents aged 40 years old or above presented 3.24 higher odds to have increased breast cancer compared to those who were ≤ 40 years old as illustrated in Table 4 (AOR:3.24, 95%CI: 1.91 to 11.36, $p<0.05$).

Table 3 Crude odds ratio (OR) and adjusted odds ratio (AOR) for socio-demographic related to breast cancer incidence.

Variables	Breast cancer		Crude OR	95% CI	AOR	95% CI
	Yes (%)	No (%)				
Age (years)						
< 40	8 (21.05)	54 (55.67)	1		1	
≥ 40	30 (78.95)	40 (44.33)	1.90***	1.19 – 2.62	3.24*	1.91 – 11.36
Marital status						
Single	2 (5.26)	25 (25.77)	1			
Married	33 (86.84)	70 (72.16)	1.77	0.53 – 3.01	1.98	0.31 – 12.52
Widowed/separate/discovered	3 (7.89)	2 (2.06)	2.93	0.94 – 4.91	8.03	0.39 – 167.22
Occupation						
Unemployment	11 (28.95)	17 (17.53)	1		1	
Labor	11 (28.95)	66 (68.04)	0.26***	0.09 – 0.69	0.35	0.10 – 1.25
Government/official/business	16 (42.11)	14 (14.43)	1.77	0.62 – 5.02	2.55	0.61 – 10.63
BMI						
<18.5	2 (5.26)	5 (5.15)	1		1	
18.5 – 22.99	27 (71.05)	53 (54.64)	1.27	0.23 – 6.19	3.40	0.31 – 41.75
>23 – 24.99	8 (21.05)	13 (13.40)	1.53	0.23 – 9.89	2.49	0.17 – 34.85
≥ 25	1 (2.63)	26 (26.80)	0.10	0.01 – 1.27	0.07**	0.01 – 0.45
Smoking						
No	20 (52.63)	61 (62.89)	1		1	
Yes	18 (47.37)	36 (37.11)		0.71 – 3.26	2.01	0.70 – 5.78
Physical activity						
Enough active	28 (73.68)	41 (42.27)	1		1	
Inactivity	10 (26.32)	56 (57.73)	0.26***	0.12 – 0.60	0.15***	0.05 – 0.47
Waist circumference (cm)						
≤ 80	23 (60.53)	28 (28.87)	1		1	
>80	15 (39.47)	69 (71.13)	0.27***	0.12 – 0.58	0.22**	0.75 – 0.65

CI: confidence interval; cm: centimeter; *** $p<0.001$; ** $p<0.01$; * $p<0.05$

Table 4 presents the AOR and 95% CI for daily food consumption. Intake of sweet food seemed to increase the risk of developing breast cancer, with the odds of patients who consumed sweet meals once a day and 3-6 days a week had an increased breast cancer risk of 96% and 99%, respectively (AOR: 0.04, 95%CI: 0.01 to 0.05, $p<0.001$; AOR: 0.01, 95%CI: 0.03 to 0.05, $p<0.01$). The odds of breast cancer risk were 34% and 86% less for participants who consumed sweet drinks >1 time/ day and 3-6 times/week compared those who consumed sweet drinks <3 times/month (AOR: 0.66, 95%CI: 0.03 to 0.07, $p<0.01$; AOR: 0.14, 95%CI: 0.04 to 0.05, $p<0.001$). Participants who consumed preserved food 3-6 times per weeks had 1.01 times higher risk of breast cancer compared to those who consumed preserved food more than 1-day time per day (AOR: 1.01, 95%CI: 1.28 to 8.09, $p<0.01$). In addition, consuming >1

time per day of soft drink presented a 1.60 higher odd for increasing breast cancer risk (AOR: 1.60, 95%CI: 2.01 to 1.39, p<0.05), while the daily consuming of energy drink reduced the risk for developing breast cancer (AOR: 0.16, 95%CI: 0.08 – 0.32, p<0.05). Instant noodle was found to decrease breast cancer risk with an AOR of 0.17 (95% CI: 0.04 to 0.82) when consumed 3-6 times per week.

Table 4 Adjusted odds ratio¹ for the daily consumption of food of participants.

Items	Crude OR	95% CI	Adjusted OR	95% CI
Sweet meals (ref.<3 times per month)				
>1 time per day	0.04****	0.01 – 0.25	0.04***	0.01 – 0.05
3-6 times per week	0.32	0.06 – 1.77	0.01**	0.03 – 0.05
Sweet drinks (ref.<3 times per month)				
>1 time per day	0.23	0.04 – 1.48	0.66**	0.03 – 0.07
3-6 times per week	1.81	0.30 – 10.64	0.14***	0.04 – 0.05
Salty foods (ref.<3 times per month)				
>1 time per day	0.01**	0.01 – 0.14	0.03	0.01 – 9.07
3-6 times per week	0.34	0.06 – 1.99	0.21	0.01 – 38.95
Fatty meals (ref.<3 times per month)				
>1 time per day	3.00	0.34 – 27.23	2.07	0.01 – 3.03
3-6 times per week	2.16	0.25 – 18.99	1.68	0.01 – 3.01
Roasted food (ref.<3 times per month)				
>1 time per day	2.19	0.58 – 3.81	0.35	0.01 – 16.01
3-6 times per week	1.26	0.22 – 2.30	4.01	0.54 – 29.50
Preserved foods (ref.<3 times per month)				
>1 time per day	3.39	0.98 – 11.72	1.52	0.53 – 4.37
3-6 times per week	3.20*	1.11 – 9.26	1.01**	1.28 – 8.09
Seasoning (ref.<3 times per month)				
>1 time per day	1.62	0.49 – 5.32	0.32	0.02 – 6.14
3-6 times per week	0.50	0.08 – 3.19	0.06	0.01 – 1.747
Soft drink (ref.<3 times per month)				
>1 time per day	0.52	0.05 – 5.23	1.60*	2.01 – 1.39
3-6 times per week	0.08*	0.02 – 0.36	0.06	0.01 – 3.72
Energy drinks (ref.<3 times per month)				
>1 time per day	0.50	0.05 – 4.64	0.16*	0.08 – 0.32
3-6 times per week	0.24*	0.07 – 0.85	2.32	0.31 – 17.47
Instant noodle (ref.<3 times per month)				
>1 time per day	0.48*	0.04 – 4.77	2.33	0.01 – 1.32
3-6 times per week	0.12*	0.03 – 0.37	0.17*	0.04 – 0.82

¹ Estimates from binary logistic model adjusted for age, marital status and occupation

Ref.: reference; CI: confidence interval; cm: centimeter; *** p<0.001; ** p<0.01; * p<0.05

Discussion

This study is the first attempt to evaluate the impact of obesity, poor food consumption patterns, and unfavorable lifestyles in relation to breast cancer risk in Indonesia. After taking into account the characteristics of the respondents, obesity, certain food groups (sweet foods and drinks, preserved foods, and instant noodles) and physical inactivity is identified as factors that may be positively associated with the risk of breast cancer. Usually, BMI is used to evaluate obesity in general, while WC is used to evaluate central obesity. Several previous studies reported that obesity is significantly associated with an increased risk of breast cancer especially in premenopausal women [20], [21]. However, studies on premenopausal women who are survivors of breast cancer, the BMI is inversely associated with breast cancer risk [22], [23].

The results of this study support this finding as among 38 participants with breast cancer in our study, most have a BMI of 18.5 - 22.99 kg/m² (71.05%) and > 23 - 24.99 kg/m² (21.05%). In line with a study conducted by Lyengar, et al (2019), this study also shows that breast cancer is more associated with the body fat level than with BMI [24]. The fact that obesity is a risk factor for some types of cancer is largely based on the use of anthropometric indexes such as body mass index (BMI) as an indirect measure of adiposity. This anthropometric measurement is a crude measure of body size that does not differentiate adiposity and muscle. People who have a normal BMI may actually have cardiometabolic disorders, which are collectively referred to as metabolic obesity in normal weight [25]. Another study using a meta-analysis shows that there is a linear relationship between BMI and breast cancer risk ($p < 0.001$), where an increase in BMI of 5 kg/m² is associated with a 2% increase in breast cancer risk with the summary relative risk (SRR) of 1.02 (95% CI: 1.01–1.04) thus showing that increased BMI can increase the risk of breast cancer [20]. Association between central obesity and breast cancer was identified in the findings of this study. This is in line with a case-control study among pre-menopause of Brazilian women that shows the association between waist circumference and breast cancer risk (OR = 3.31, 95% CI 1.45–7.55) [23]. Based on a previous study, WC is more widely used to measure central obesity than other anthropometric measurement indicators. This consideration is based on the fact that waist circumference is used to measure the risk of mortality risk caused by normal-weight central obesity and has the ability to identify pragmatic clinical measures to assist in identifying those at risk [26]. The central obesity can amplify the risk of estrogen receptor-negative breast cancers [27].

When assessing unfavorable lifestyle, the findings of this study indicate that physical inactivity is significantly associated with breast cancer. On the other hand, smoking is not shown to have any relation with breast cancer. In line with the Physical Activity Guidelines Committee for American scientific report in 2018, physical activities reduces the risk of breast cancer [28]. In addition, many studies have shown that physically active women have a lower risk of breast cancer than inactive women. Working women tend to have a low physical activity status that increases the risk of developing breast cancer [29] [30]. Low physical activity is also associated with malnutrition that can lead to an increased risk of breast cancer. Both underweight women and obese women tend to have lower activity than women with normal nutritional status, so they are more at risk of developing breast cancer [31]. Physical activity is

associated with reduced risk of breast cancer through several mechanisms, including reducing the production of hormones such as estrogen. High levels of estrogen can stimulate the growth and division of breast epithelial cells, which may increase the risk of cancer by allowing the spread of genetic errors. Therefore, it is necessary to have adopted adequate physical activities to prevent breast cancer [32], [33].

In addition, previous studies have proven for decades that nutrition plays an important influence on the risk of developing cancer [34], [35]. This study found that consuming sweet foods is associated with decreasing breast cancer risk. Also, it was identified that a high consumption of soft drink is significantly associated with increasing breast cancer risk (AOR: 1.60, 95%CI: 2.01 to 1.39, $p < 0.05$) while daily consumption of energy drink reduced the risk for developing breast cancer. Sugary drinks, also categorized as sugar-sweetened beverages or “soft” drinks, refer to any beverage added with sugar or other sweeteners (high fructose corn syrup, sucrose, fruit juice concentrates, and more). This includes soda, pop, cola, tonic, fruit punch, lemonade, sweetened powdered drinks, sports drinks, and energy drinks [36]. As a category, these beverages comprise the single largest source of calories and added sugar. Sugary drink consumption is rising dramatically due to the widespread urbanization and beverage marketing, particularly in developing countries, including Indonesia [37], [38]. Many studies showed that the consumption of sugary drinks and artificially sweetened beverages is significantly associated with the risk of overall cancer, including breast cancer [39], [34]. Cancer cells require glucose to produce energy to support their rapid growth and spread. They also need a lot of other nutrients such as amino acids and fats. Furthermore, sugary food and sugary drink consumption are associated with glucose metabolism which requires insulin that can increase tumorigenesis either through a direct effect on epithelial tissue or indirectly by influencing the levels of other modulators such as the insulin-like growth factor (IGF) receptor group, sex hormones, and adipokines. Hyperinsulinemia and higher IGF-1 levels are also well-known to be associated with breast cancer risk [40].

Findings in this study also show that processed food consumption is also associated with the incidence of breast cancer. This supports the finding of a previous cohort study stating that a 10% increase in the proportion of ultra-processed foods in the diet is significantly associated with a more than 10% increase in the overall risk of cancer, including breast cancer [41]. Preserved food often contains higher total fat, saturated fat, sugar, and salt, but lower in fiber and vitamins. In addition, it also has potential carcinogenic properties from food additives used, such as sodium nitrite in processed meat [42]. Although preservatives such as nitrate are generally considered safe, there are several concerns regarding their actual safety that raise from, among others, the formation of carcinogenic nitrosamines from nitrites [43]. Other food preservatives such as sodium benzoate and potassium sorbate are also associated with the risk of various health problems. Sodium benzoate is thought to be linked to the possibility of allergies and has immunosuppressive effects. Interactions between sorbate and nitrites in the digestive tract is also regarded to produce a series of genotoxic compounds [43]. Based on the recommendation from WHO (2016) through the Joint FAO/WHO Expert Committee on Food Additives (JECFA) the acceptable daily intakes (ADIs) of benzoate and sorbate are 0–5 mg/kg body weight/day for benzoic acid (and benzoate salts) and 0–25 mg/kg body weight/day for sorbic acid (and sorbate salts).

A major strengths in this study are high response rate of the participants (100%), use of standardized protocol for data collections, and include the measurements of BMI and WC that are well known to be factors that may predict the development of breast cancer. The biological mechanisms that may work for most of these lifestyle factors seem to be mediated by adipose tissue, with chronic low-grade inflammation creating an environment that encourages breast cancer to develop and grow. Sedentary lifestyle has also been linked to increased risk for estrogen receptor (ER)-positive breast cancer [44]. However, some limitations should be acknowledged. Firstly, reporting of repeated diet history may be biased due to short memory of the respondents. Secondly, several factors related to lifestyle such as measurement of physical activity and smoking are in the form of self-reported questionnaires. As a result, they may have been misclassified. Third, this study is an observational study with a cross-sectional approach where the cofounding variables are difficult to separate so that the causality relationship of the observed variables is difficult to determine. In addition, it is necessary to consider eating patterns and lifestyles that can be influenced by local culture or customs.

Conclusion

In conclusion, this study indicates that obesity, waist circumference, smoking habit, and physical activity are associated with lower breast cancer risk. Unsurprisingly, smoking shows no significant relationship with increased breast cancer risk. Poor dietary habits characterized by the consumption of preserved food and soft drinks appear to be linked to increased risk for breast cancer, while sweet meals and sweet drinks are inversely associated with the increase in breast cancer. Although a small protective effect of sedentary lifestyle against breast cancer incidence is identified, the role of healthy lifestyle should still be emphasized using an integrated approach and an effective strategy is required to encourage women to adopt a healthy lifestyle.

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Conflict of interest

Author(s) declare no conflict of interest.

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Dokumen pendukung luaran Tambahan #1

Luaran dijanjikan: Artikel di Jurnal Nasional terakreditasi peringkat 1-3

Target: Accepted

Dicapai: Sedang direview

Dokumen wajib diunggah:

1. Naskah artikel
2. Bukti sedang direview

Dokumen sudah diunggah:

1. Naskah artikel
2. Bukti sedang direview

Dokumen belum diunggah:

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Title: Geographic characteristics of various cancers in Yogyakarta Province, Indonesia: a spatial analysis at the community level

Running title: Geographic characteristics of various cancers.

Abstract

Background: Cancer remains a significant public health problem in Indonesia and worldwide. Yogyakarta Province has the largest number of cancer cases in Indonesia. The incidence trends and geographical distributions of various cancers in Indonesia have not been reported. Therefore, this study elucidated spatial and temporal cancer incidence patterns in Yogyakarta Province.

Methods: Cancer patient data registered by the Yogyakarta Provincial Health Office during 2019-2020 were analysed in this study (n=9,933). To evaluate cancer pattern distributions, ArcGIS 10.2 and Excel 2016 software were used.

Results: The mean participant age (\pm standard deviation) was 55.08 ± 15.46 years, and 79.40% were female. Breast and cervical cancer were the most frequently diagnosed, and the majority of patients were located in Sleman district. The incidence of all cancer types varied by sex. The majority of cancer patients lived below the poverty line. Cancer screening rates were low, and screening was limited to breast and cervical cancer.

Conclusion: Various types of cancers were identified in Yogyakarta, Indonesia; of them, breast and cervical cancer predominated. Most of the cancer patients were from Sleman district and economically poor areas. Geospatial techniques are useful for identifying environmental factors related to cancer and improving cancer control strategies and resource allocation.

Keywords: Epidemiology, Cancer, Indonesia, Spatial, Geographic information system

Introduction

Non-communicable diseases (NCDs), such as heart disease, stroke, cancer, diabetes, and chronic lung disease, account for more than 70% of deaths globally. Based on data from the World Health Organization (WHO) in 2021, more than 15 million people aged 30-69 years have died because of NCDs. According to mortality data, cancer is the second most common cause of death worldwide, accounting for 9.3 million deaths, of which more than half occur in Asia (Bray et al., 2018; Sung et al., 2020) and in developing countries (Bellanger et al., 2018; Rivera-Franco and Leon-Rodriguez, 2018). In Indonesia, cancer is the third most common

NCD after cardiovascular diseases and maternal, perinatal, and nutritional conditions. Data from the Indonesian Ministry of Health in 2021 indicated that breast cancer (42.1 per 100,000 population, with a mortality rate of 17 per 100,000 population) and cervical cancer (23.4 per 100,000 population, with a mortality rate of 13.9 per 100,000 population) account for the majority of cancers registered in the country. Early diagnosis of cancer through cancer screening improves treatment opportunities and reduces mortality (Seely and Alhassan, 2018; Pastorino et al., 2019) and has been shown to increase life expectancy in cancer patients (Allemani et al., 2015). However, routine cancer screening, as recommended by the WHO, is rarely performed in Indonesia. The reason is similar to that in other developing countries; resources needed for cancer screening programmes, such as mammography screening and Pap smears, are limited in Indonesian health care settings.

Cancer incidence patterns vary among different populations and are influenced by type of work, sex, lifestyle, environment, social status, cultural aspects, ethnicity, geographic characteristics, nutrition, health care access, and other unknown factors (Landrine et al., 2017; Sighoko et al., 2018; Arem and Loftfield, 2018; Jinyao et al., 2018; Zhu et al., 2019; Huang and Chen, 2020; Mathur et al., 2020). In previous studies, it was reported that cancer patients belonging to racial or ethnic minority groups and patients with very low socio-economic status had significantly lower rates of survival (Singh and Jemal, 2017; Siegel et al., 2021). The cancer distribution patterns in Indonesia vary among different provinces. Of the 34 provinces in Indonesia, Yogyakarta Province has the highest prevalence of cancer, at 4.86 per 1,000 population, followed by West Sumatra Province, at 2.47 per 1,000 population, and Gorontalo Province, at 2.44 per 1,000 population. Various efforts to prevent and control cancer have been implemented by the Indonesian government. One such effort is the community movement programme for healthy living, which includes attending regular health checks, avoiding smoking, performing routine physical activity, consuming a balanced diet, receiving adequate rest, and managing stress. In addition, to reduce the incidence of the most predominant cancer in Indonesia, clinical breast examinations (CBEs) in women aged 30-50 years and visual inspection with acetic acid (VIA) are performed to screen for breast cancer and cervical cancer, respectively.

However, public awareness of early cancer screening and the adoption of a healthy lifestyle (such as avoiding smoking, performing routine exercise, and eating a balanced diet) are still very low in Indonesia (Solikhah et al., 2021). A gap in health care facility availability among islands currently exists in Indonesia, resulting in a lack of access to health care and low health care capacity; thus, only a small number of cancer patients seek early medical care

(Gondhowiardjo et al., 2021). The health care service gap may have impacts on the non-uniform distribution of cancer among various provinces in Indonesia. Data from the National Institute of Health Research and Development Indonesia (2019) showed that cancer incidence rates varied, and there was a four-fold difference between the areas with the lowest and highest incidence rates. Previous studies have reported that geographical location plays a critical role in the incidence of and mortality due to different types of cancers in patients in different locations (Roquette et al., 2019). Studies on cancer incidence trends based on patient areas in Indonesia have been limited thus far.

Geographic information systems (GIS) and spatial analyses have become hot topics worldwide with regard to elucidating disease patterns and understanding the epidemiology of diseases, including cancer. Visual displays created by GIS programs can support communications with policymakers and guide the formulation of prevention and control plans to reduce cancer incidence and cancer-related mortality, as cancer risk factors may vary among regions and islands. In Indonesia, which has many islands and ethnicities, an understanding of differences in cancer incidence and mortality among islands is crucial. GIS can help epidemiologists accurately identify trends and link diseases to potential causes or risk factors in a tangible and location-based manner based on descriptive and analytical data (Khashoggi and Murad, 2020; Wan et al., 2020). Indonesia, which is the fourth most populous country in the world, with more than 270 million inhabitants spread across 34 provinces and 16,056 islands, has experienced challenges in characterising the spread of diseases, including mapping the cancer incidence in each region of Indonesia. Therefore, this study aims to conduct spatial and temporal analyses in an effort to identify the incidence patterns of cancer in Yogyakarta Province, Indonesia.

Materials and methods

Study population

This study was conducted in Yogyakarta Province, which is located on the southern part of Java Island; the province is located at 8°30' - 7°20' south latitude and 109° 40' - 111° 0' east longitude. Yogyakarta Province has a total size of 3,133.15 square kilometres. The province has one city, Yogyakarta city, and four districts: Sleman, Gunungkidul, Bantul, and Kulonprogo districts. Yogyakarta city has a population of 435,936 people, while the Sleman, Gunungkidul, Bantul, and Kulonprogo districts have population sizes of 1,232,598, 749,274, 1,029,997, and 434,483 people, respectively. Geographical attributes, such as the locations of roads, hospitals, health centres, clinics, and district/city facilities; population per district;

district area; topographic characteristics; and demographics, were retrieved from the regional development planning agency in Yogyakarta Province. Data regarding population density and the number of people with low socio-economic status per district/city in Yogyakarta Province were retrieved from the 2020 census, organized by the central statistics bureau of Indonesia (Statistics Indonesia). These factors were added as new fields in the spatial databank of the area in ArcGIS 10.2 to be included in the analysis.

Cancer data

Data on the number of cancer cases from 2019 to 2020 were obtained from the Yogyakarta Provincial Health Office. The data were collected from several hospitals in Yogyakarta, such as Sardjito Hospital, Bethesda Hospital, Hardjolutukito Hospital, and Panti Rapih Hospital, based on the criteria of cancer diagnosis. The hospitals regularly report new cancer cases, which are diagnosed according to the International Classification of Diseases, revision 10 (ICD-10), using a unified cancer reporting card. Yogyakarta has a highly mobile population, with 3,882,288 permanent residents; therefore, we included only registered residents during the 2019-2020 period. Cancers were defined as ICD-10 codes C50, C69, C53, C34, C18-C20, C91-C95, C61, C11, C43-C44, and C22. A total of 9,933 cancer cases were recorded at the Yogyakarta Provincial Health Office from 2019-2021.

Data analysis

Descriptive statistics were used to summarize the attributes of cancer patients. Continuous variables are reported as the mean \pm standard deviation, while categorical variables are reported as weighted percentages. To understand the distributions of cancer cases in each district/city of Yogyakarta Province, an overlay was constructed based on the weighted matrix. Overlaying was employed to understand cancer distributions based on locality and to reveal rate patterns across districts/cities with reasonably high populations because extreme data may interfere with the evaluation of patterns. Incorporating other variables within districts or cities of the province may help reveal more stable patterns. Overlay analysis was used to determine the distribution trends of cancer cases based on the number of families with low socio-economic status and the availability of health facilities. Finally, ArcGIS version 10.2 was overlaid to produce an integrated map of epidemiological characteristics of cancer in Yogyakarta Province during 2019-2020.

Ethical consideration

The study protocol and informed consent form were approved by the Ethics Committee of Universitas Ahmad Dahlan under the ethical clearance number 012102016.

Results

A total of 9,933 cancer cases were reported in Yogyakarta Province from 2019 to 2020, of which 79.40% (n=7,887) occurred in women, and 20.60% (n=2,046) occurred in men; the cancer patients had an average age of 55.08 ± 15.46 years (Table 1). The most common types of cancer identified in this province were breast cancer and cervical cancer in women. Among men, the following were the most frequently reported cancers, in descending order: colorectal cancer (18.24 per 100,000 population), nasopharyngeal cancer (6.36 per 100,000 population), skin cancer (5.60 per 100,000 population), and lung cancer (4.01 per 100,000 population) (Figure 1). In addition, the two most common types of cancer in the five districts in Yogyakarta Province were slightly different. In Sleman district, the dominant cancers found during 2019-2020 were breast cancer and colorectal cancer; in Bantul district, they were breast cancer and cervical cancer; in Yogyakarta city, they were breast and colorectal cancer; and in Gunungkidul district, they were breast cancer and cervical cancer (Figure 2). The district accounting for the largest number of cancer cases in Yogyakarta Province was Sleman district (64.8%) (Figure 2).

Regarding the incidence rates during the study period, Sleman district had the highest incidence rate in 2019, but that rate decreased in 2020. In contrast, in Yogyakarta city, there was a rate increase of more than 2% in 2020. To explore the possibility that certain settings influence the development of cancer, analyses according to socio-economic status and distance to health facilities based on postal code were performed. The results showed that the majority of cancer patients resided in low socio-economic areas (Figure 3), and most of the health facilities (such as hospitals and public health centres) were located in Sleman district, which was also the district in which the majority of cancer patients were located (Figure 4).

Although various types of cancers have been reported in Yogyakarta Province (Figure 2), due to health budget and resource limitations in the province, the provincial government has chosen to focus prevention efforts on only breast and cervical cancers due to their high incidence in the province. Cancer screening, with CBE for breast cancer and VIA for pre-cervical cancer, is performed in only women aged 30-50. The cancer detection rate via screening was calculated based on the number of women undergoing CBE and VIA screening

divided by the number of women aged 30-50 years old per 1,000 individuals. As shown in Figure 5, the highest detection rate was in Yogyakarta city (13%), while the highest incidence of breast and cervical cancer was in Sleman district.

Discussions

Cancer remains the NCD that causes the largest number of deaths worldwide, especially in developing countries; this may be because most cancer patients in these countries are diagnosed at an advanced stage. Although cancer screening is recommended by the WHO for the early detection of cancer, as well as the prevention cancer-related deaths, complex challenges such as inadequate health care infrastructure (Anderson et al., 2015), poverty (Jagsi et al., 2018), insufficient budget allocation for cancer (Voda and Bostan, 2018), and low awareness of breast cancer risk and community cancer screening programmes (Solikhah et al., 2019) have driven resource-limited countries towards alternative approaches for cancer prevention. These low-cost cancer prevention strategies include increasing public awareness through cancer-related education, increasing the acceptance of cancer screening, offering low-cost cancer screening, and addressing preventable risk factors for cancer (e.g., avoiding smoking, increasing physical activity, losing weight, and reducing alcohol consumption) (Meyskens et al., 2016; Stewart et al., 2016; Britt et al., 2020). Cancer education is one of the key elements in the fight against cancer (DePinho and Hawk, 2016); however, low literacy rates in developing countries are a major obstacle in the implementation of programmes (Gupta et al., 2015). Cancer mapping using GIS enables the timely updating of information, and the georeferenced data are easily accessible to policymakers for the implementation of cost-effective cancer prevention measures. GISs are also useful tools for analysing morbidity and mortality within an area, as well as assessing the distribution of, utilization of, and disparities among health services; these data can be used plan interventions and determine priorities in cancer prevention (Wan et al., 2020). To the best of our knowledge, the present study is the first community-based study reporting on the spatio-temporal distributions of various cancers, particularly in Indonesia.

According to the this study during the 2019-2020 period, 9,933 cancer cases were reported from different areas. Of these, most cancer patients were from Sleman district, which is an area located in the northern part of Yogyakarta Province; the cancer detection rate in Sleman district was higher than the provincial rate. The geospatial analysis demonstrated that most of the cancer patients living in Sleman district suffered from breast cancer, followed by cervical cancer. However, the initial screening rates for both cancers were lower in Sleman

district, as demonstrated by the low VIA and CBE screening rates, than those in Yogyakarta city, the capital of Yogyakarta Province. This finding will help guide policymakers and public health practitioners in targeting specific areas for the maximum allocation of cancer prevention resources. The benefit of cancer screening is measured by the number of life-years gained from the prevention or early diagnosis of cancer. Previous studies have provided guidelines for screening recommendations (White et al., 2017), which have been proven to be effective in reducing the burden of various cancer. These screening recommendations include 1) cytology (Pap smears) for women aged 30-65 years old to detect cervical cancer; 2) mammography for women aged 50-74 years, with a 2-year interval, to detect breast cancer; 3) a faecal occult blood test (FOBT) once a year, sigmoidoscopy once every 5 years, colonoscopy once a year, and faecal immunochemical testing once every 10 years to detect colorectal cancer; and 4) low-dose helical computed tomography to detect lung cancer (X Wang et al., 2018). However, almost all of these screening approaches are unaffordable in countries with inadequate health care infrastructure, such as Indonesia (Tabrizi et al., 2018). Therefore, in Indonesia, CBE and VIA to detect breast cancer and pre-cervical cancer, respectively, are the only screening strategies implemented. A previous study also revealed that the level of knowledge and the availability of information about screening are factors that affect the early detection of cancer (Nuryana et al., 2020)

The current study demonstrated that the predominant cancers differed by sex. In women, the most dominant cancers in the province were breast cancer and cervical cancer, while in men, the dominant cancers were colorectal cancer, nasopharyngeal cancer, skin cancer, and lung cancer. Our findings are in line with those of previous study conducted in the United States in 2019 that showed that the incidence rates of cancers were different between males and females (Siegel et al., 2021). Sex disparities are important factors that are potentially influenced by biological processes and have an impact on cancer incidence, prognosis, and mortality. These differences have the potential to influence the immune response to foreign antigens and self-antigens, including chronic inflammatory diseases such as cancer (Carè et al., 2018). The fact that the most prevalent cancers in women in this study were breast cancer and cervical cancer (79.40%) supports the results of a global study that also found breast and cervical cancer to be the leading causes of cancer-related deaths (Fitzmaurice et al., 2017; Siegel et al., 2021).

Age is also an important risk factor for some types of cancer, and most cancer patients in this study were diagnosed when they were ≥ 55 years old. However, approximately 19.22%

and 0.79% of the cancer cases in this study occurred in patients who were < 45 years old and <18 years old, respectively. This is in line with the results of a previous study by Partridge et al. (Partridge et al., 2016), who evaluated the association between age and breast cancer in women and found that young women aged <40 years had lower odds of survival than women aged 51-60 years (HR: 1.9; 95% CI: 1.6 to 2.3). Another study conducted in women in Southeast Asia showed that among breast cancer risk factors, age over 40 years was associated with a 1.5 times increased risk of breast cancer development (Nindrea et al., 2017). In addition, patients who are diagnosed with colon cancer at an age ≤ 50 years have a higher risk of advanced-stage cancer than older patients (≥ 60 years old) (Gabriel et al., 2018). This supports the results of previous studies that found that most young patients tended to have poorer adherence to adjuvant endocrine therapy than older patients, leading to a lower survival rate (Eraso, 2019).

This study also explored socio-economic characteristics and travel distances to health care facility sites for cancer screening (i.e., hospitals and public health centres), which have been recognized as key factors influencing significant geographic inequities and accessibility to cancer screening. Our study revealed that most cancer patients lived in lower socio-economic areas (Figure 3), although their homes were relatively close to cancer screening sites. It is worth noting that cancer patients belonging to lower socio-economic classes tend to have low screening rates worldwide; low rates have been reported for cervical cancer screening in China (Bao et al., 2018), prostate cancer in Switzerland (Guessous et al., 2016), breast cancer screening in different races in the United States (Singh and Jemal, 2017; Elewonibi et al., 2018), and breast cancer screening in Kurdish women in Iran (Aminisani et al., 2016). According to previous studies, the incidence rate of cancer, especially in low-resource countries (LRCs), is influenced by demographic transitions, changing disease patterns, unhealthy lifestyles, and community behaviour (Drake et al., 2020). Further, the mortality rate of cancer is higher in LRCs than in developed countries (Ghoncheh and Salehiniya, 2016). Therefore, it is necessary to implement appropriate alternative and sustainable programmes, including routine health services such as VIA for pre-cervical cancer screening, breast self-examination, and CBE for breast cancer screening in these countries, especially countries with limited health care resources, such as Indonesia (Denny et al., 2017).

We acknowledge that this study had some limitations. First, regarding the geographic analysis, shifts in the geographic characteristics of variables, such as patient location, county, district/city, hospital location, and others, should be considered. Mitigation efforts have been

applied; however, using tools to check postal codes and district assignments may help in the updating of target areas. The second limitation is that the data used in this study were obtained from a national passive surveillance system; these systems are known to grossly under-report the number of cancer cases. This could potentially affect the estimates of the mean incidence, proportion of cancer cases, and observed spatial patterns in this study. Nevertheless, this study still has major strengths. It is the first study in Indonesia to analyse routine cancer data collected by health offices and produce a cancer distribution map by cancer type for each district/city in the entire province. Additionally, the proportion of cancer cases in this study reflects the incidence of cancer in the study area and can be used to identify environmental risks associated with this disease, as the data were obtained from a population-based survey in the community.

Conclusions

Several types of cancers were identified in Yogyakarta Province, with breast cancer and cervical cancer being the most common. Moreover, Sleman district was the district with the largest number of cancer cases in the province. Despite the fact that the incidence rates of different cancer types vary by sex, most cancer cases were diagnosed at a young age. Additionally, the majority of the patients had a low socio-economic status, which was related to the low cancer screening rate. This study provides basic knowledge about geographical and environmental attributes that might be valuable in the implementation of focused control measures targeting vulnerable populations. This enables the optimal utilization of available resources, which is essential in developing countries with limited health screening resources such as Indonesia. The overlaid cancer case map is an easy-to-use tool that can guide the implementation of targeted and cost-effective control measures by relevant health authorities.

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Table 1 Characteristics of cancer patients during the 2019-2020 period (n=9,933)

Characteristics	Number	Percentage (%)
Sex		
Female	7,887	79.40
Male	2,046	20.60
Age (Years)		
< 18	78	0.79
18 - 44	1,909	19.22
45 - 54	2,920	29.40
≥ 55	5,026	50.60
Cancer		
Breast cancer	6,035	60.76
Retinoblastoma cancer	56	0.56
Cervical cancer	636	6.40
Lung cancer	189	1.90
Colorectal cancer	982	9.89
Leukaemia	109	1.10
Prostate cancer	368	3.70
Nasopharyngeal cancer	206	2.07
Skin cancer	311	3.13
Liver cancer	163	1.64
Bone cancer	36	0.36
Brain cancer	136	1.37
Thyroid cancer	484	4.87
Others	222	2.23
District/City		
Sleman	7,553	76.04
Kulonprogo	43	0.43
Bantul	613	6.17
Yogyakarta	1,613	16.24
Gunungkidul	111	1.10

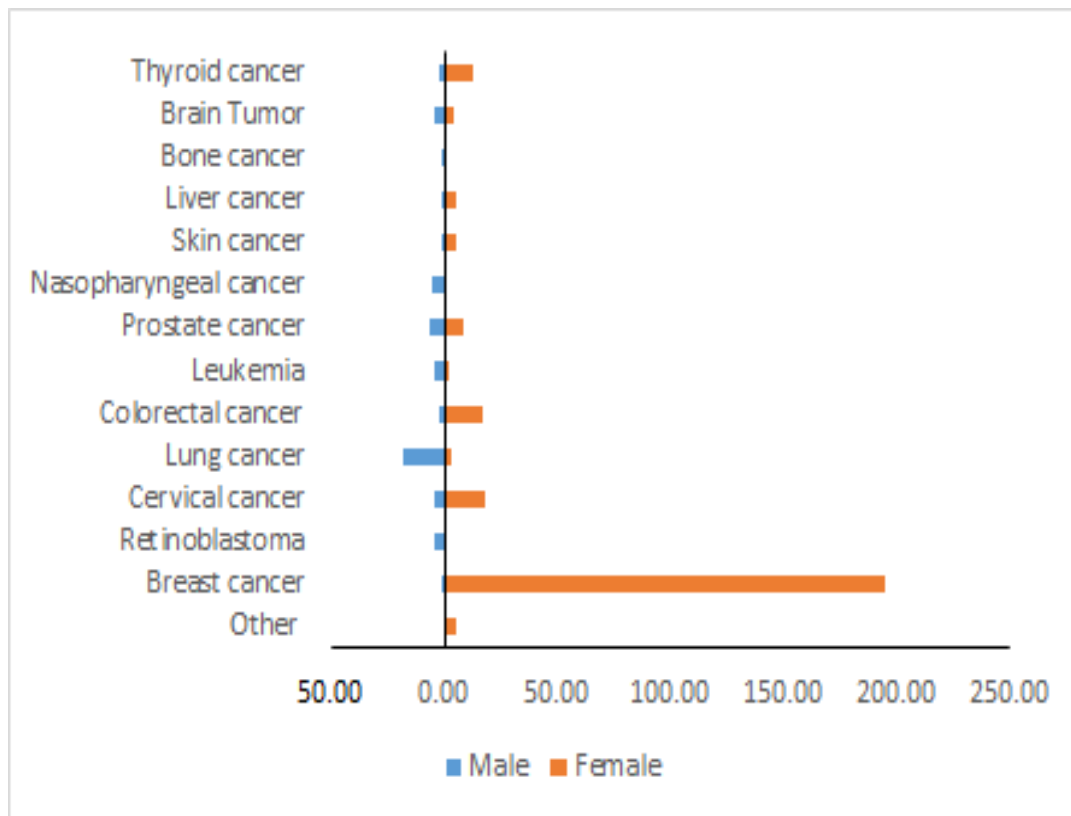


Figure 1. Cancer incidence ($^{\circ}/_{00}$) by sex during the 2019-2020 period.



Figure 2. Cancer distribution by type in Yogyakarta Province

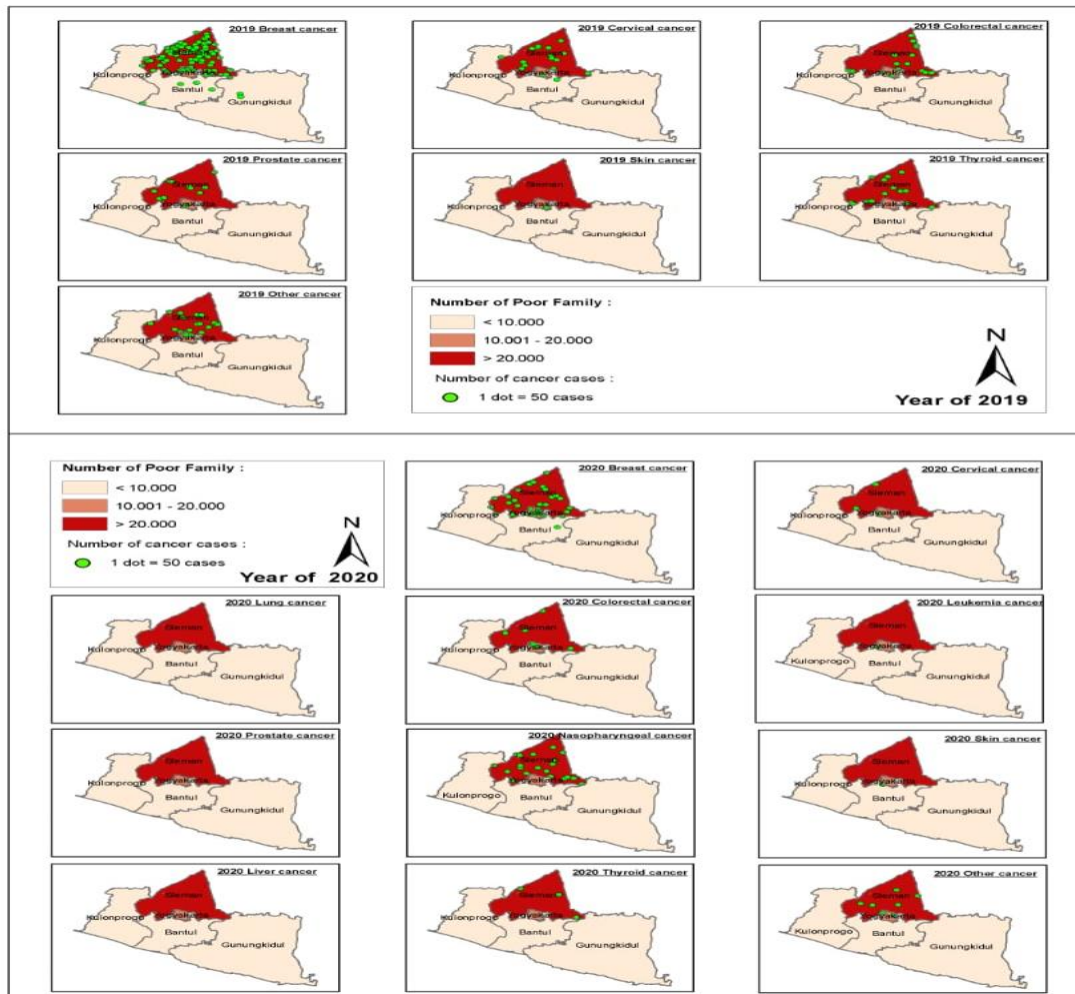


Figure 3. Geographical distribution of cancer by low socio-economic status

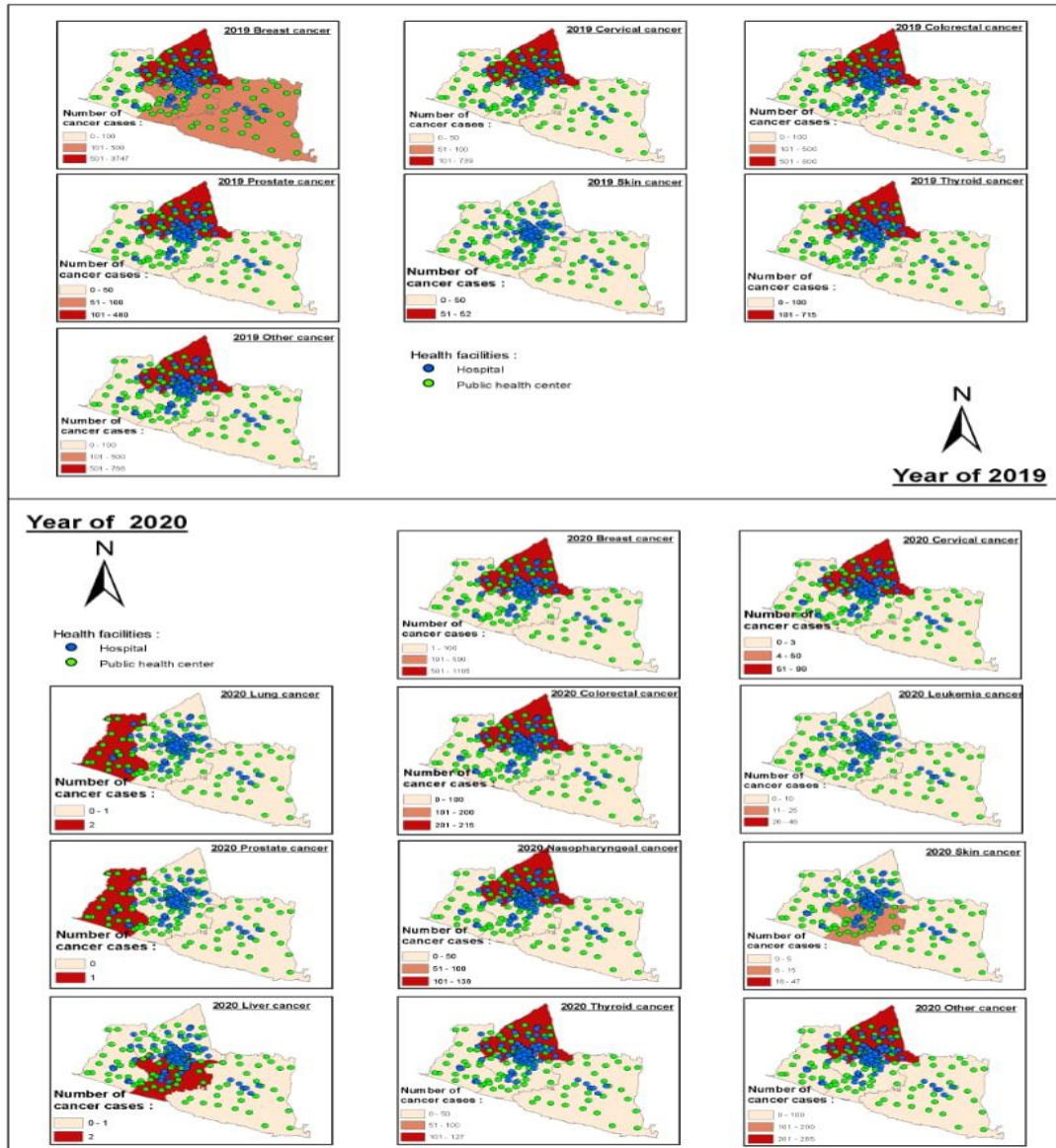


Figure 4. Geographical distribution of cancer by availability of health care facilities

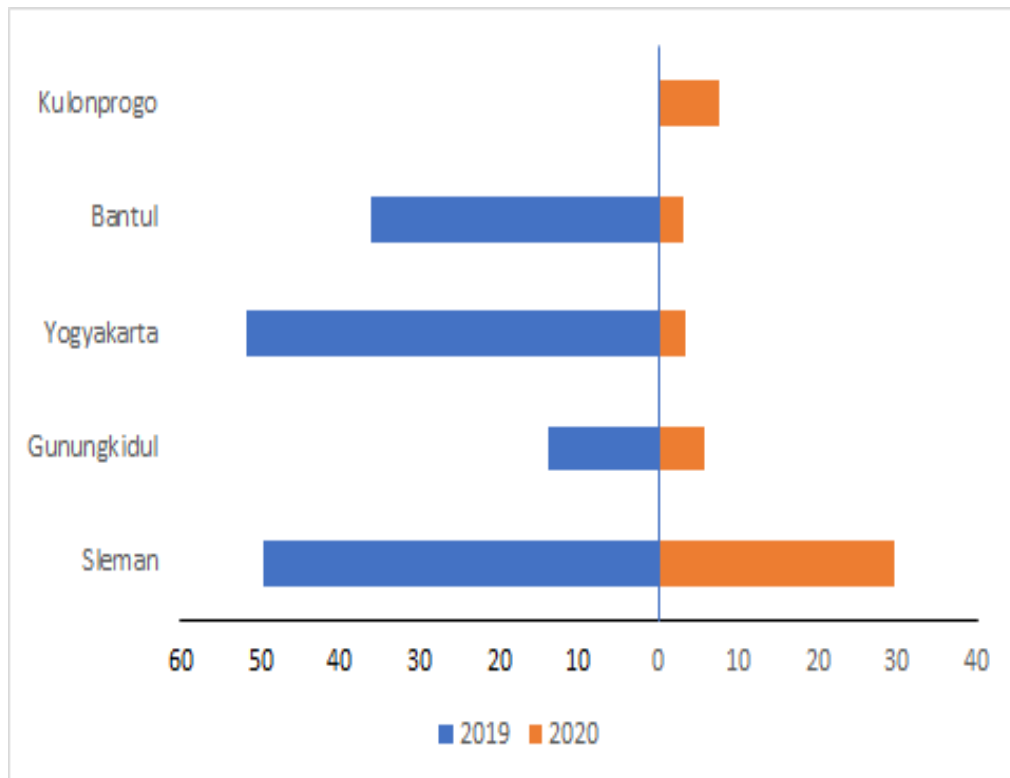


Figure 5. Breast cancer and cervical cancer screening detection rate among women aged 30-50 during the 2019-2020 period.

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ASIAN PACIFIC JOURNAL OF CANCER PREVENTION



Official publication of the Asian Pacific Organization for Cancer Prevention (APOCP)

Manuscript ID	APJCP-2108-7178
Manuscript Title	Geographic characteristics of various cancers in Yogyakarta Province, Indonesia: a spatial analysis at the community level
Manuscript Type	Research Articles
Section	Epidemiology (Incidence, Prevalence, Survival, Statistical modeling, GIS)
Running Title	Geographic characteristics of various cancers
Main Subjects	Epidemiology / Public Health Epidemiology - Offered Subjects: epidemiology, public health, geographic information system
Abstract	<p>Background: Cancer remains a significant public health problem in Indonesia and worldwide. Yogyakarta Province has the largest number of cancer cases in Indonesia. The incidence trends and geographical distributions of various cancers in Indonesia have not been reported. Therefore, this study elucidated spatial and temporal cancer incidence patterns in Yogyakarta Province.</p> <p>Methods: Cancer patient data registered by the Yogyakarta Provincial Health Office during 2019-2020 were analysed in this study (n=9,933). To evaluate cancer pattern distributions, ArcGIS 10.2 and Excel 2016 software were used.</p> <p>Results: The mean participant age (+ standard deviation) was 55.08 ± 15.46 years, and 79.40% were female. Breast and cervical cancer were the most frequently diagnosed, and the majority of patients were located in Sleman district. The incidence of all cancer types varied by sex. The majority of cancer patients lived below the poverty line. Cancer screening rates were low, and screening was limited to breast and cervical cancer.</p> <p>Conclusion: Various types of cancers were identified in Yogyakarta; of them, breast and cervical cancer predominated. Most of the cancer patients were from Sleman district and economically poor areas. Geospatial techniques are useful for identifying environmental factors related to cancer and improving cancer control strategies and resource allocation.</p>
Keywords	Epidemiology, Cancer, Indonesia, Spatial, Geographic information system
Submit Date	2021-08-01 11:43:14

Author's Comment

Ref. UAD 1119.05.4 August 1, 2021

To Asian Pacific Journal of Cancer Prevention (APJCP),
<http://journal.waocp.org/journal/editorial.board>

Dear Editor in Chief,

Greetings from Indonesia and wishing you a great day with happiness and healthy condition in this era COVID-19.

We as the research collaboration team are writing the manuscript entitled "Geographic characteristics of various cancers in Yogyakarta Province: a spatial analysis at the community level" for consideration for publication in Asian Pacific Journal of Cancer Prevention. This manuscript was written using the author guidelines of Asian Pacific Journal of Cancer Prevention mentioned on the website. We would like to inform that this novelty and impact regarding our finding of this study. To the best of our knowledge, the present study is the first community-based study reporting on the spatio-temporal distributions of various cancers, particularly in Indonesia. We aimed to elucidate spatial and temporal cancer incidence patterns in Yogyakarta Province, as the highest area of cancer incidence compared to other province in Indonesia. Cancer patient data registered by the Yogyakarta Provincial Health Office during 2019-2020 were analysed in this study (n=9,933). To evaluate cancer pattern distributions, ArcGIS 10.2 and Excel 2016 software were used. The mean participant age (+ standard deviation) was 55.08 ± 15.46 years, and 79.40% were female. Breast and cervical cancer were the most frequently diagnosed, and the majority of patients were located in Sleman district. The incidence of all cancer types varied by sex. The majority of cancer patients lived below the poverty line. Cancer screening rates were low, and screening was limited to breast and cervical cancer. Various types of cancers were identified in Yogyakarta; of them, breast and cervical cancer predominated. Most of the cancer patients were from Sleman district and economically poor areas. Geospatial techniques are useful for identifying environmental factors related to cancer and improving cancer control strategies and resource allocation.

This paper also describes our original work and is not under consideration by any other journal. All authors approved the manuscript and this submission. The two co-authors do not have any conflict of interest regarding this manuscript. This document was reported as the result of the research we conducted as one of the requirements of our responsibility as a researcher in our university. Lastly, we do hope that this article can be published in this journal so that we can become the first researchers from Indonesia who can contribute our research results in this journal.

Thank you for receiving our manuscript and considering it for review. We do really appreciate your time and look forward to seeing your response.

Best Wishes,

Dr. Solikhah Solikhah
Faculty of Public Health, Universitas Ahmad Dahlan, Yogyakarta, Indonesia

Current Status	Manuscript Assigned to Reviewers
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