

Lampiran1

I. ASUHAN KEBIDANAN PADA MASA KEHAMILAN

Kunjungan Pertama

ASUHAN KEBIDANAN PADA KEHAMILAN NY.S, USIA 26 TAHUN,
G2P1AB0AH1, UK 38 MINGGU 2 HARI DENGAN KEK DAN
RIWAYAT GANGGUAN JIWA
DI PMB ENDANG ISTIROHATI

Tanggal pengkajian : 9 Januari 2024
Tempat : PMB ENDANG ISTIROHATI
No. RM : 20003xx

Data Subyektif

1. Identitas

Biodata	Istri	Suami
Nama	: Ny. S	Tn. W
Umur	: 26 tahun	52 tahun
Pendidikan	: SMA	SMP
Pekerjaan	: IRT	Karyawan swasta
Agama	: Islam	Islam
Suku/ Bangsa	: Jawa/ Indonesia	Jawa/ Indonesia
Alamat	: Karang Sari, Purwodadi, Purworejo	

2. Alasan Kunjungan

Ibu mengatakan ingin memeriksakan kehamilannya.

3. Keluhan Utama

Ibu mengatakan merasa cemas menghadapi persalinan.

4. Riwayat Menstruasi

Menarche	: 12 tahun	Siklus : 28 hari
Lama	: 7 hari	Teratur : Teratur

Sifat Darah : Cair (khas menstruasi) Keluhan : Tidak ada

5. Riwayat Perkawinan

Status pernikahan : Menikah Menikah ke : Kedua

Lama pernikahan sekarang: 1 tahun

Usia menikah pertama kali : 20 tahun

6. Riwayat Obstetrik : G₂P₁A₀Ah₁

Hamil Ke	Persalinan						Nifas		
	Tahun	Umur kehamilan	Jenis Persalinan	Penolong	Komplikasi	JK	BB Lahir	Laktasi	Komplikasi
1	05-03-2019	35 minggu	Spontan	Bidan	-	P	1800	+	-
2	Hamil ini								

7. Riwayat kontrasepsi yang digunakan

Ibu pernah menggunakan alat kontrasepsi suntik 3 bulanan sebelum hamil ini

8. Riwayat Kehamilan sekarang

a. HPHT : 2 Mei 2023 HPL : 9 Februari 2024 Uk: 36 Minggu

b. ANC pertama usia kehamilan : 9 minggu 4 hari

c. Kunjungan ANC

No	TM	Frekuensi	Tempat	Keluhan	Terapi
1	I	1 kali	PKD Karang Sari	Pusing, mual	Asam folat, B6
2	II	3 kali	PKD Karang Sari, PMB Endang	Tidak ada	Tablet tambah darah, Vitamin C, Kalsium
3	III	6 kali	PMB Endang, PKD Karang Sari	Cemas menghadapi persalinan	Tablet tambah darah, Kalk

d. Imunisasi TT : TT 5 Tahun 2020

e. Pergerakan Janin dalam 12 jam (dalam sehari) : Lebih dari 10 kali

9. Riwayat Kesehatan

- a. Ibu mengatakan tidak sedang/pernah menderita penyakit jantung, TBC, ginjal, DM. Ibu belum pernah menjalani operasi, dan tidak memiliki alergi apapun baik makanan maupun obat, Ibu mengatakan pernah mengalami gangguan jiwa sudah tidak berobat lagi.
- b. Ibu mengatakan dalam keluarga tidak ada yang sedang/pernah menderita penyakit jantung, hipertensi, asma, DM, ginjal, maupun TBC

10. Pola Pemenuhan Kebutuhan sehari-hari

Sebelum Hamil	Setelah Hamil
a. Pola Nutrisi 1) Makan Frekuensi : 3 x/hari Porsi : 1 piring Jenis : nasi, sayur, lauk Keluhan : tidak ada Alergi makanan : tidak ada 2) Minum Frekuensi : 5-6x/hari Porsi : 1 gelas Jenis : air putih, teh Keluhan : tidak ada	2-3 x/hari 1 piring Nasi, sayur, lauk Tidak ada Tidak ada Frekuensi : 8-9x/hari Porsi : 1 gelas Jenis : air putih, susu Keluhan : tidak ada
b. Eliminasi 1) BAB Frekuensi : 1x/hari Konsistensi : Lunak Warna : Khas Keluhan : tidak ada 2) BAK Frekuensi : 5-6x/hari Warna : Khas Keluhan : tidak ada	Frekuensi : 1x/hari Konsistensi : Lunak Warna : Khas Keluhan : tidak ada Frekuensi : 6-8x/hari Warna : Khas Keluhan : tidak ada
c. Istirahat Tidur Malam Lama : 6-7 jam/hari	7 jam/hari
d. Personal Hygiene Mandi : 2 x/hari Ganti pakaian : 2 x/hari Gosok gigi : 2 x/hari	2 x/hari 2 x/hari 2x/hari
e. Pemenuhan Seksualitas Frekuensi : 2-3 x/minggu	2x/minggu

Keluhan : tidak ada	Tidak ada
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f. Pola aktifitas (terkait kegiatan fisik, olah raga)

Ibu mengatakan selain bekerja juga melakukan pekerjaan rumah tangga di rumah.

11. Kebiasaan yang mengganggu kesehatan (merokok, minum jamu, minuman beralkohol)

Ibu mengatakan tidak mempunyai kebiasaan yang dapat mengganggu kesehatan seperti merokok, minum jamu, minuman beralkohol. Suami juga tidak merokok maupun minum minuman keras.

12. Psikososiospiritual:

Ibu dan suami sangat senang dengan kehamilan ibu. Kehamilan ini merupakan kehamilan yang kedua dan ibu sudah menantikan kehamilannya. Ibu sangat senang dengan kehamilannya . Suami sangat mendukung ibu.

Ibu berhubungan baik dengan lingkungan sekitar.

Ibu beragama Islam dan beribadah sholat 5 waktu/hari.

Ibu berencana melahirkan di Puskesmas

Ibu berencana merawat bayinya dengan dibantu oleh keluarga dan akan memberikan ASI eksklusif.

Ibu dan suami akan menggunakan BPJS saat melahirkan.

13. Pengetahuan ibu (tentang kehamilan, persalinan, dan laktasi)

Ibu mengatakan mengetahui tentang tanda-tanda persalinan.

14. Lingkungan yang berpengaruh (sekitar rumah dan hewan peliharaan)

Ibu mengatakan lingkungan di sekitar rumah bersih,dan ibu tidak mempunyai hewan peliharaan apapun.

Data Obyektif

1. Pemeriksaan Umum

Keadaan Umum : Baik

Kesadaran : Composmentis

Vital Sign

Tekanan Darah : 120/70 mmHg Nadi : 80x/menit
Pernafasan : 22 x/menit Suhu : 36.6 °C
Berat badan sekarang : 44 kg Tinggi badan : 150 cm
(IMT 18,2kg/m²) LILA : 22 cm
Pertambahan berat badan 4 kg

2. Pemeriksaan Fisik

- a. Kepala : Bentuk mesocephal, tidak ada massa/benjolan.
- b. Muka : Bentuk oval, tidak ada oedema, terdapat cloasma gravidarum
- c. Mata : Bentuk simetris, konjungtiva pucat, sclera putih.
- d. Hidung : tidak ada polip, tidak ada infeksi.
- e. Mulut : Bibir lembab, tidak ada caries gigi
- f. Leher : tidak ada pembengkakan vena jugularis, tidak ada pembesaran kelenjar limfe
- g. Dada : Tidak ada ronkhi, tidak ada retraksi dada
- h. Payudara: simetris, tampak hiperpigmentasi areola, puting susu menonjol
- i. Abdomen : Tidak ada bekas luka, tidak terdapat linea nigra, terdapat striae gravidarum

Palpasi :

1) Leopold I

TFU pertengahan px dan pusat fundus teraba bagian bulat, lunak, tidak melenting (bokong)

2) Leopold II

Bagian kiri ibu teraba memanjang seperti papan, ada tahanan dan keras (punggung)

Bagian kanan ibu teraba kecil-kecil, banyak, (ekstremitas)

3) Leopold III

Bagian terendah janin teraba satu bagian bulat, keras, melenting (kepala), kepala sudah masuk PAP

4) Leopold IV

Divergen, 4/5

TFU menurut Mc. Donald : 26 cm, TBJ : 2335 gram

Auskultasi DJJ : 144 x/menit, irama teratur kuat

j. Ekstremitas : tidak terdapat oedema baik pada tangan maupun kaki, ujung jari tidak pucat.

3. Pemeriksaan Penunjang Tanggal : 3 Januari 2024

Hb : 11,4gr/dl

Analisis Data

Seorang ibu Ny. S usia 26 Tahun G₂P₁A₀Ah₁ hamil 36 minggu, janin tunggal, hidup, intra uteri presentasi kepala dengan KEK dan Riwayat Gangguan Jiwa

DS : Ibu mengatakan berusia 26 Tahun

Ibu mengatakan ini kehamilan Kedua

Ibu mengatakan HPHT tanggal 2 Mei 2023

Ibu mengatakan cemas menghadapi persalinan

Data Obyektif:

KU : baik

Kesadaran : composmentis

Vital sign

TD : 120/70 mmHg N : 80 x/menit

S : 36,6 °C RR : 22 x/menit

Px. Leopold :

1). Leopold I : TFU pertengahan pusat dan px, teraba bokong di fundus

2). Leopold II : Punggung kiri

3) Leopold III : Presentasi kepala

4). Leopold IV : divergen 4/5

DJJ : 144 X/menit, irama teratur, kuat

TFU mc Donald : 26 cm TBJ : 2335 gram

Masalah

KEK

Riwayat Gangguan Jiwa

Ibu merasa cemas menghadapi persalinannya yang semakin dekat

Identifikasi Diagnosa Potensial

Kala I lama

Perdarahan post partum

Asfiksia

BBLR

Antisipasi Tindakan Segera

Pemberian KIE tentang tanda, persiapan persalinan dan nutrisi dalam kehamilan.

Penatalaksanaan

1. Memberi tahu ibu berdasarkan hasil pemeriksaan yang dilakukan kondisi ibu dan janin baik
Evaluasi: Ibu mengatakan senang dan lega
2. Memberi konseling tentang keluhan yang dialami oleh klien, tanda bahaya kehamilan dan tanda-tanda persalinan serta persiapan menghadapi persalinan. Tanda persalinan meliputi: Timbulnya his persalinan ialah his pembukaan dengan sifat-sifatnya sebagai berikut: 1) Nyeri melingkar dari punggung memancar ke perut bagian depan, 2) Makin lama makin pendek intervalnya dan makin kuat intensitasnya, 3) Kalau dibawa berjalan bertambah kuat, 4) mempunyai pengaruh pada pendataran dan atau pembukaan cervix 5) *Bloody show* (Lendir disertai darah) 6) pecahnya kulit ketuban. Bila ibu menemui hal tersebut agar segera menghubungi petugas kesehatan. Persiapan persalinan meliputi tempat persalinan, penolong, perlengkapan ibu dan bayi, transportasi, pendamping dan dana. Tanda bahaya Ibu hamil trimester III meliputi keluar darah dari jalan lahir, demam, sakit kepala hebat disertai pandangan kabur, ibu tidak sadar. Disarankan ibu/keluarga harus segera menghubungi tenaga kesehatan.

Evaluasi: Ibu mengatakan mengerti penjelasan yang diberikan

3. Memberikan dukungan kepada ibu agar ibu tetap tenang dan menunggu tanda persalinan dirasakan, karena jika ibu khawatir dan cemas maka akan menghambat hormone yang melepaskan reaksi persalinan

Evaluasi: Ibu mengatakan sedikit tenang.

4. Memberikan motivasi ibu untuk rutin melaksanakan senam ibu hamil di rumah agar persalinan bisa berjalan dengan lancar.

Evaluasi: Ibu mengatakan akan melakukan senam hamil di rumah, karena ibu sudah cuti dari pekerjaan.

5. Memberikan tablet Fe 1x1 sehari yaitu:

- a) Minum zat besi diantara waktu makan atau 30 menit sebelum makan, karena penyerapan berlangsung lebih baik ketika lambung kosong.
- b) Menghindari mengkonsumsi kalsium bersama zat besi (susu, antasida, makanan tambahan prenatal), karena akan menghambat penyerapan zat besi dalam tubuh.
- c) Mengkonsumsi vitamin C (jus jeruk, jambu, tambahan vitamin C), karena dapat digunakan untuk meningkatkan absorpsi zat besi non heme (berasal dari tumbuhan).⁹¹

Evaluasi: Ibu mengatakan mengerti dan akan menghabiskan obat yang diberikan.

6. Menganjurkan ibu untuk melakukan kunjungan ulang 7 hari lagi atau jika ibu ada keluhan.

Evaluasi: Ibu mengatakan mengerti dan akan kontrol ulang bila obat habis.

7. Mendokumentasikan hasil tindakan yang dilakukan

Catatan Perkembangan Kehamilan

Pertemuan Ke II

Tanggal pengkajian : 17 Januari 2024
Tempat : Kunjungan Rumah
No. RM : 20003xx

Data Subyektif

Ny. Smengatakan kadang kencang-kencang, tapi belum teratur. Gerakan janin aktif.

Riwayat Menstruasi : Menarche Usia 12 tahun, siklus 28 hari, lamanya 7 hari, teratur, sifat darah khas, keluhan tidak ada.

HPHT : 2 Mei 2023 HPL: 9 Februari 2024

Uk : 37minggu 1 hari

Riwayat Obstetri : G2P1A0Ah1

1. Hamil ini

Riwayat Kesehatan : Tidak ada riwayat penyakit jantung, hipertensi, asma, DM, ginjal, maupun TBC dalam keluarga.

Riwayat Psikososial : Ibu merasa lebih siap menghadapi persalinan karena sudah merasa kenceng-kenceng perutnya

Data Obyektif

KU : Baik

Kesadaran : CM

TD : 100/60 mmHg

RR : 22 x/menit

HR : 80 x/menit

T : 36.5⁰c

Palpasi abdomen: Teraba bokong di fundus uteri, puki, presentasi kepala, divergen 4/5 (Mc. Donald = 27 cm)

Auskultasi : 132x/ menit teratur

Analisis

Seorang ibu Ny. S usia 26 Tahun G₂P₁A₀Ah₁ hamil 37 minggu 1 hari, janin tunggal, hidup, intra uteri, presentasi kepala, BDP (belum dalam persalinan)

Penatalaksanaan

1. Memberi tahu ibu dan suami hasil pemeriksaan, ibu dan janin baik, ibu belum dalam persalinan.

Evaluasi: Ibu dan suami mengatakan mengerti penjelasan yang diberikan.

2. Memberi tahu ibu kencang-kencang yang dialami ibu masih merupakan his palsu menjelang trimester akhir kehamilan. Kontraksi atau his yang adekuat adalah his yang datang secara teratur, yakni 3-4x dalam 10 menit lamanya 30-40 detik.

Evaluasi: Ibu mengatakan mengerti penjelasan yang diberikan

3. Memberi penjelasan lagi kepada ibu tentang tanda-tanda persalinan, yaitu : kencang-kencang teratur pada perut semakin lama semakin sakit, keluarnya lendir darah dari jalan lahir dan keluarnya air ketuban.

Evaluasi: Ibu mengatakan mengerti penjelasan yang diberikan.

4. Menganjurkan kepada ibu untuk memantau gerakan janin. Gerakan janin dapat menjadi penanda kesejahteraan janin dalam kandungan. Gerakan janin yang aktif atau baik adalah minimal 10 kali gerakan dalam waktu 12 jam. Bila gerakan janin kurang dari 10 kali dalam 12 jam, maka ibu harus segera memeriksakan kondisi janin ke fasilitas kesehatan terdekat.

Evaluasi: Ibu mengatakan memahami penjelasan yang diberikan

5. Memberikan dukungan kepada ibu agar ibu tetap tenang dan menunggu tanda persalinan dirasakan, karena jika ibu khawatir dan cemas maka akan menghambat hormone yang melepaskan reaksi persalinan. Bila ibu tenang, maka persalinan akan terjadi.

Evaluasi: Ibu mengatakan merasa tenang dan semangat

6. Memberi terapi Ibu tablet tambah darah 1x1 selama 7 hari dan menganjurkan ibu menghabiskan tablet tambah darah.

Evaluasi: Ibu mengatakan mengerti dan akan menghabiskan obat yang diberikan

7. Memberi tahu kepada ibu jadwal kunjungan ulang yakni pada 1 minggu yang akan datang atau bila ada keluhan.

Evaluasi: Ibu mengatakan setuju dengan jadwal kunjungan ulang.

II. ASUHAN KEBIDANAN PADA IBU BERSALIN

Tanggal/ Jam : 25 Januari 2024 / 19.00 WIB

Tempat RSUD R.A.A Tjokronegoro, Purworejo

Data Subyektif

Ibu mengatakan bahwa ibu sudah melahirkan di PMB Endang Istirohati tgl 25 Januari 2024 jam 14.00, dan di rujuk ke Rumah Sakit karena terjadi perdarahan pasca persalinan. Ibu menceritakan bahwa ibu datang ke PMB Endang Istirohati jam 08.00 karena merasa kenceng-kenceng teratur sejak habis subuh. Ibu melahirkan spontan jam 14.00 di Puskesmas dalam persiapan rujukan ke RS atas indikasi kala 2 lama. dan pada pukul 15.00 ibu di rujuk ke RS atas indikasi perdarahan Post Partum.

Setelah mendapatkan penanganan di IGD perdarahan dapat diatasi, dan ibu masuk bangsal nifas untuk observasi 1X24 jam. Dilakukan pemeriksaan Hb pasca perdarahan, dengan hasil Hb 10 gr/dl sehingga ibu mendapatkan terapi tambah darah 2X1.

Analisis :

Ny. S umur 26 Tahun P2A0 Ah2Nifas H-0 dengan riwayat perdarahan postpartum

Masalah: tidak ada.

Penatalaksanaan :

1. Memberikan dukungan dan support mental serta rasa syukur kepada Tuhan Yang Maha Esa dengan mengucapkan selamat atas kelahiran anaknya dan turut bergembira

Evaluasi: Ibu senang dengan kelahirannya.

2. Mengajarkan untuk mobilisasi dini yaitu dengan latihan miring kanan dan kiri, kemudian dilanjutkan dengan latihan duduk

Evaluasi: Ibu belajar menyusui bayinya

3. Mengajarkan kepada ibu untuk minum air putih 2-3 liter/hari, dan menghabiskan porsi makan yang disediakan.

Evaluasi: Ibu mengatakan memahami penjelasan yang diberikan.

4. Memberikan rujukan dan melibatkan suami dalam pengambilan keputusan untuk di lakukan rujukan ke rumah sakit.

Evaluasi :suami mengerti dengan penjelasan yang di berikan

III. ASUHAN KEBIDANAN PADA IBU NIFAS

Pengkajian :

Askeb Ibu Nifas Hari ke-3

Pengkajian

Tanggal : 28 Januari 2024

Jam : 09.00WIB

Data Subyektif

Keluhan Utama

Ibu mengatakan sudah cukup sehat, dapat beristirahat,ASI sudah keluar, BAK lancar namun jahitan masih perih, ibu belum BAB dikarenakan takut..

Data Obyektif

1) Keadaan Umum

Keadaan umum : Baik

Kesadaran : Composmentis

2) Tanda-tanda vital

Tensi : 110/70 mmHg

Nadi : 84 x/menit
Suhu : 36,9⁰celcius
RR : 20x/menit

3) Pemeriksaan Obstetri

Mammae : membesar, puting susu menonjol, hiperpigmentasi areola, ASI (+),

Abdomen : TFU 2 jari dibawah pusat, kandung kemih kosong, kontraksi uterus keras.

Genetalia : lochea sanuienta, tidak berbau busuk, terdapat luka pada perineum, basah, baik, tidak ada tandatanda infeksi.

PPV ± 10 cc.

Analisa

Ny.S umur 26 Tahun P2A0 Ah2, pot partum hari ke 3

Penatalaksanaan

1. Memberitahu ibu bahwa hasil pemeriksaan baik, TD : 110/70 mmHg, TFU 2 jari dibawah pusat, kandung kencing kosong dan pengeluaran pervaginam berupa darah,dengan jumlah yang normal
Evaluasi: Ibu mengatakan senang mengetahui hasil pemeriksaan baik dan dalam kondisi normal.
2. Memberi penjelasan pada ibu tentang cara menjaga kebersihan genetalia, yaitu dengan cara membersihkan genetallia setelah BAB/BAK dengan air bersih&sabun dariarah depan ke belakang, setelah itu di lap kering menggunakan tissue/kain yang bersih. Mengganti pembalut jika dirasakan basah atau setiap 4 jam sekali.
3. Menganjurkan kepada ibu untuk BAB saat terasa ingin BAB, Menjelaskan kepada ibu untuk banyak mengkonsumsi air putih minimal 2lt, buah-buahan dan sayuran agar feses tidak tidak keras
4. Memberi KIE pada Ibu tentang teknik menyusui yang benar dan mempraktekkan langsung pada bayi.

- a. Memperhatikan posisi bayi
 - 1) Kepala bayi dan badan bayi harus dalam satu garis yaitu bayi tidak dapat mengisap dengan mudah apabila kepalanya bergeser atau melengkung
 - 2) Muka bayi menghadap payudara dengan hidung menghadap puting yaitu seluruh badan bayi menghadap badan ibu
 - 3) Ibu harus memegang bayi dekat pada ibu.
 - 4) Apabila bayi baru lahir, Ibu harus menopang bokong bukan hanya kepala dan bahu merupakan hal yang penting untuk bayi baru lahir.
 - b. Memberi tahu tanda bayi menyusu dengan efektif adalah:
 - 1) Bayi terbuka matanya lebar-lebar seperti menguap, dengan lidahnya ke bawah dan kedepan persis sebelum ia merapatkan mulutnya di payudara
 - 2) Ia menarik puting dan sebagian besar areola masuk kedalam mulutnya
 - 3) Dagunya meleku pada payudara ibu dan hidungnya menyentuh susu ibu
 - 4) Bibirnya dipinggir dan lidahnya menjulur diatas gusi bawahnya
 - 5) Rahangnya bergerak secara ritmis ketika bayi disusui
 - 6) Bayi mulai disusui dengan singkat dan cepat. Begitu susu mengendur, ia menyelesaikan ke dalam corak yang lambat dengan penuh susu dan jeda waktu yang singkat.⁸⁴
6. Memberi KIE tentang perawatan payudara yang benar yakni
- a. Tidak membersihkan puting dengan sabun, alcohol, atau zatiritan lainnya. Pada puting susu dapat dioleskan ASI

- sebelum dan selesai menyusui dan biarkan mengering sebelum memakai BH
- b. Menyusui lebih sering (8-12 kali dalam 24 jam) sehingga payudara tidak sampai terlalu penuh
 - c. Selain itu juga perawatan puting susu yang lecet sementara puting susu yang lecet tidak digunakan untuk menyusui/istirahat selama sedikit-dikitnya selama 24 jam. Peras ASI dari payudara yang lecet. Jika perlu pada waktu menetek menggunakan alat pelindung puting susu. Peras ASI dari payudara yang lecet bila setelah disusu.
 - d. Menggunakan BH yang menyangga.⁹⁵
7. Memberi KIE tentang cara meningkatkan produksi ASI, ibu disarankan untuk sering mengonsumsi daun katuk. Selain daun katuk, Ibu juga bisa mengonsumsi temu lawak. Menurut Kemenkes cara mengonsumsi temulawak untuk meningkatkan produksi ASI yaitu bahan ramuan : Temulawak 7 iris, Meniran 1/2 genggam, Pegagan 1/4 genggam, Air 3 gelas. Cara pembuatan yaitu mencampurkan semua bahan kemudian direbus dalam air mendidih selama 10 sampai 15 menit dengan api kecil. Diminum 2 kali sehari, pagi dan menjelang tidur malam. Selain dengan cara itu, suami Ny S juga bisa mendukung Ibu dalam meningkatkan produksi ASI yaitu dengan cara akupressur. Titik akupressur yang disarankan menurut Kemenkes adalah dilakukan pemijatan pada perpotongan garis tegak lurus dari sudut kuku bagian kelingking. Lokasi yang terletak 4 jari di bawah tempurung lutut di tepi luar tulang kering.
8. Memberi KIE pada Ibu tentang nutrisi selama menyusui.
- Kebutuhan gizi selama menyusui meliputi:
- a) Karbohidrat

Saat 6 bulan pertama menyusui, kebutuhan ibu meningkat sebesar 65 gr per hari atau setara dengan 1 ½ porsi nasi.

b) Protein

Sangat diperlukan untuk peningkatan produksi air susu. Ibu menyusui membutuhkan tambahan protein 17 gr atau setara dengan 1 porsi daging (35 gr) dan 1 porsi tempe (50gr).

c) Lemak

Kebutuhan minyak dalam tumpeng gizi seimbang sebanyak 4 porsi atau setara dengan 4 sendok the minyak(20 gr). Lemak yang diperlukan untuk ibu menyusui yaitu lemak tak jenuh ganda seperti omega-3 dan omega-6

d) Vitamin yang penting dalam masa menyusui adalah vitamin B1, B6, B2, B12, vitamin A, yodium & selenium. Jumlah kebutuhan vitamin & mineral adalah 3 porsi sehari dari sayuran dan buah-buahan.

e) Ibu menyusui sangat membutuhkan cairan agar dapat menghasilkan air susu dengan cepat. Dianjurkan minum 2-3 liter air per hari atau lebih dari 8 gelas air sehari (12-13 gelas sehari). Terutama saat udara panas, banyak berkeringat dan demam sangat dianjurkan untuk minum >8 gelas sehari.

f) Waktu minum yang paling baik adalah pada saat bayi sedang menyusui atau sebelumnya, sehingga cairan yang diminum bayi dapat diganti. Kebutuhan cairan dapat diperoleh dari air putih, susu, jus buah-buahan dan air yang tersedia di dalam makanan.

IV. ASUHAN KEBIDANAN PADA BAYI BARU LAHIR USIA 8 HARI

Tanggal : 3 Februari 2024 pkl: 12.30 WIB

Identitas Bayi

Nama : Bayi Ny.S

Tanggal/ Jam Lahir : 25 Januari 2024/ 14.00 WIB

Jenis kelamin : Perempuan

Data Subyektif

1) Riwayat Persalinan Sekarang

Ibu mengatakan melahirkan secara spontan pada tanggal 25 Januari 2024 pukul 14.00 WIB. Persalinan ditolong oleh bidan, jenis kelamin laki-laki, berat badan 3100 gram, panjang badan 49 cm, lingkar kepala 34 cm. Bayi lahir menangis segera setelah lahir.

2) Pola Pemenuhan Kebutuhan Sehari-Hari

a) Pola Nutrisi

Saat ini bayi hanya minum ASI.

b) Pola Eliminasi

Bayi sudah BAB sehari 1 kali normal dan BAK 8-10 kali.

c) Pola Istirahat

Bayi masih sering tidur. Tidur malam 10 jam, tidur siang sekitar 8 jam.

d) Pola Hygiene

Bayi dimandikan sehari 2 kali, dibersihkan kemaluannya dan diganti popoknya setiap selesai BAK dan BAB.

Data Obyektif

1) Pemeriksaan Fisik

Pemeriksaan Umum

Keadaan umum: bayi sehat, gerakan aktif, menangis kuat, tonus otot baik

Vital Sign

Denyut Jantung : 130x/menit Suhu : 37⁰ CRR : 60x/menit

Pengukuran Antropometri

BB : 3200 gram Lingkar Kepala/LK : 34 cm

PB : 49 cm Lingkar Dada/ LD : 33 cm

2) Pemeriksaan fisik

Kepala : Mesocephal, tidak ada caput sukcedanum, tidak ada cephal hematoma

Mata : Konjungtiva merah muda, sclera putih

Hidung : tidak terdapat pernapasan cuping hidung

Leher : Tidak ada pembengkakan vena jugularis

Dada : tidak ada retraksi dada, tidak ada stridor maupun ronkhi

Abdomen : Tidak ada pembesaran pada perut, tali pusat sudah puput.

Genitalia : testis telah masuk ke dalam skrotum, tidak ada hipospadia

Kulit : tidak ikterik

Analisis

Bayi Ny.S , Usia 7 hari, Bayi Fisiologis

Penatalaksanaan

1. Memberitahu ibu bahwa dari hasil pemeriksaan bayi nya sehat

Evaluasi : ibu mengatakan senang mengetahui keadaan bayi nya sehat

2. Menganjurkan kepada ibu untuk memberikan ASI dan menyusui bayi sesering mungkin , karena semakin sering menyusui maka semakin banyak prolaktin dan produksi asi akan meningkat sehingga bayi tumbuh sehat dan optimal. Ibu sebaiknya meberikan asi saja tanpa tambahan apapun termasuk air putih dan susu formula selama 6 bulan (ASI Eksklusif) dan meneruskan pemberian ASI dengan tambahan MP-ASI (Makanan Pendamping ASI) hingga anak berusia 2 tahun.

Evaluasi : ibu mengatakan bersedia untuk menyusui bayi nya secara eksklusif

3. Memberikan KIE tentang imunisasi BCG an menganjurkan ibu untuk mengimunitasikan bayi nya sebelum bayi berusia 3 bulan. Memantau pertumbuhan dan perkembangan bayi dengan melakukan penimbangan setiap bulan di posyandu, melakukan stimulasi perkembangan anak.

Evaluasi : Ibu mengatakan dapat memahami penjelasan yang diberikan

Lampiran 1

Inform Consent

INFORMED CONSENT (SURAT PERSETUJUAN)

Yang bertanda tangan di bawah ini:


Nama : Siti Arbangatun
 Tempat/Tanggal Lahir: Purworejo, 07 Januari 1996
 Alamat : Karangsari RT 002 RW 001
 Kecamatan Purwodadi , Kabupaten Purworejo


Bersama ini menyatakan kesediaan sebagai subjek dalam praktik Continuity of Care (COC) pada mahasiswa Prodi Pendidikan Profesi Bidan T.A. 2023/2024. Saya telah menerima penjelasan sebagai berikut:

1. Setiap tindakan yang dipilih bertujuan untuk memberikan asuhan kebidanan dalam rangka meningkatkan dan mempertahankan kesehatan fisik, mental ibu dan bayi. Namun demikian, setiap tindakan mempunyai risiko, baik yang telah diduga maupun yang tidak diduga sebelumnya.
2. Pemberi asuhan telah menjelaskan bahwa ia akan berusaha sebaik mungkin untuk melakukan asuhan kebidanan dan menghindari kemungkinan terjadinya risiko agar diperoleh hasil yang optimal.
3. Semua penjelasan tersebut di atas sudah saya pahami dan dijelaskan dengan kalimat yang jelas, sehingga saya mengerti arti asuhan dan tindakan yang diberikan kepada saya. Dengan demikian terdapat kesepahaman antara pasien dan pemberi asuhan untuk mencegah timbulnya masalah hukum di kemudian hari.

Demikian surat persetujuan ini saya buat tanpa paksaan dari pihak manapun dan agar dipergunakan sebagaimana mestinya.

Purworejo, Januari 2024







Mahasiswa : 
 (Elo Mariyah)


Klien : 
 (Siti Arbangatun)

Daftar Hadir Kegiatan

DAFTAR HADIR KEGIATAN

NAMA MAHASISWA : ELO MARIYAH
 NIM : P07124523209
 NAMA PASIEN : SITI ARBANGATUN
 JUDUL KASUS : ASUHAN BERKESINAMBUNGAN PADA NY. S UMUR 26 TAHUN G2P1A0 DENGAN KEK FAN GANGGUAN JIWA DI PMB ENDANG ISTIROHATI KABUPATEN PURWOREJO
 TEMPAT : PMB ENDANG ISTIROHATI

NO	HARI/TANGGAL	KEGIATAN	TANDA TANGAN
1	9-1 2024	Memberikan asuhan kebidanan pada Ny. S umur 26 tahun, multigravida hamil 36 minggu dengan resiko tinggi (Resti)	
2	17 Januari 24	Memberikan asuhan kebidanan pada Ny. S umur 26 tahun	
3	25 Januari 24	Memberikan asuhan kebidanan pada Ny. S P2A0 nifas hari ke	
4	28 Januari 24	Memberikan asuhan kebidanan pada Ny. S P2A0 nifas hari ke	
5	3 Februari 24	Memberikan asuhan kebidanan pada Ny. S P2A0 nifas hari ke	
6	-	Memberikan asuhan kebidanan pada Ny. S PA0 nifas hari ke	

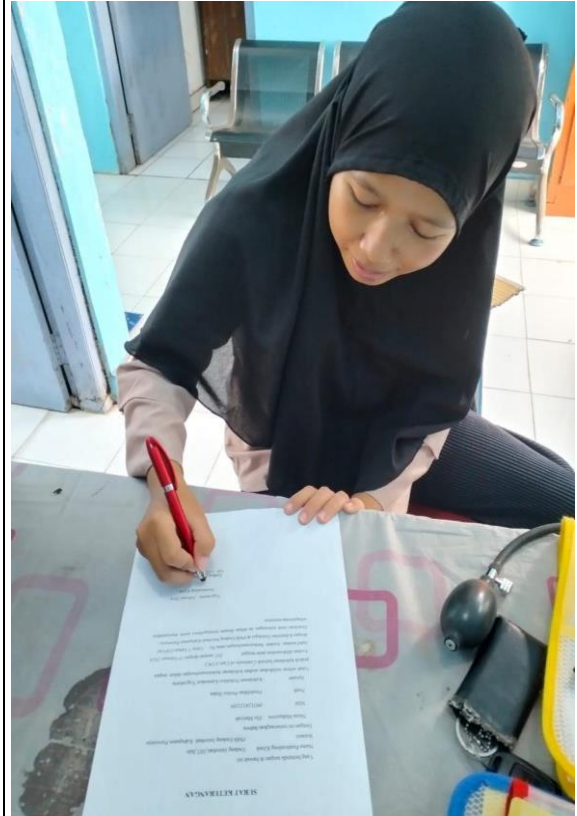
Yogyakarta, 2024
 Pembimbing Klinik

 (Endang Istirohati, SST, Bdn)

Lampiran 2

Penyerahan Kenang-Kenangan



Inform consent

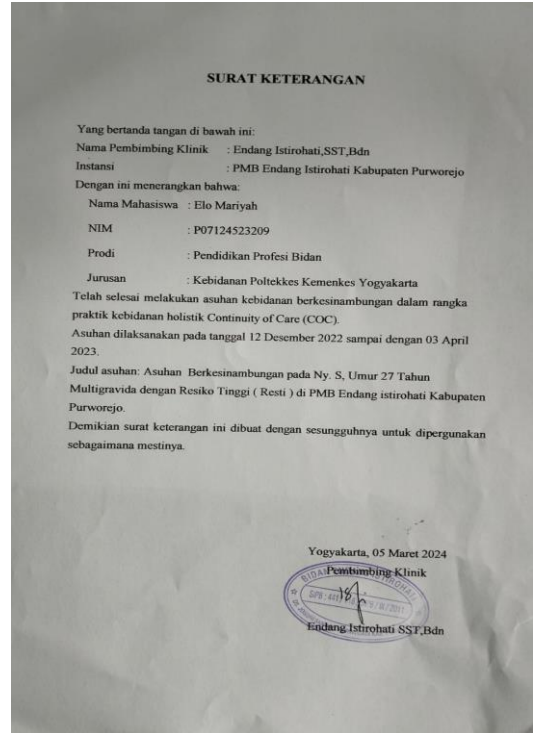


Lampiran 3

Pemeriksaan ANC



Surat Pernyataan



Pemeriksaan PJB



Pemeriksaan SHK



KN I



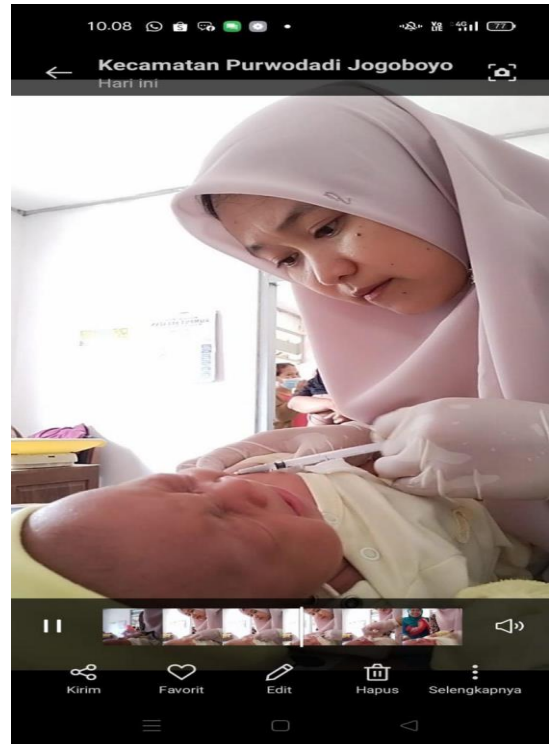
Kunjungan Nifas



KN II



BCG



> Nihon Koshu Eisei Zasshi. 2016;63(12):738-749. doi: 10.11236/jph.63.12.738.

[Nutritional status and dietary intake among pregnant women in relation to pre-pregnancy body mass index in Japan]

[Article in Japanese]

Kaoru Uno ¹, Yukari Takemi, Fumi Hayashi, Momo Hosokawa

Affiliations + expand

PMID: 28100893 DOI: 10.11236/jph.63.12.738

Abstract

Objective The present study examined nutritional status and dietary intake of pregnant women in Japan in relation to pre-pregnancy body mass index (BMI). **Methods** Participants included 141 Japanese women with singleton pregnancies, from the outpatient department of the S hospital, Gunma prefecture, Japan. Two-day food records, dietary assessment questionnaires, and clinical records were obtained at 20 weeks gestation. Nine patients were excluded from the study due to morning sickness. The remaining 132 participants were divided into 3 groups according to pre-pregnancy BMI: underweight, normal weight, and overweight. Nutritional status and dietary intake were analyzed in relation to BMI using the chi-square test, Fisher's exact test, Kruskal-Wallis test, one-way analysis of variance, and analysis of covariance with adjustment for age, employment status, and total energy intake. **Results** Women who were underweight before pregnancy were more frequently working full-time than normal weight and overweight women. Underweight women were also more frequently anemic (P=0.038, underweight 39.3%, normal weight 24.7%, overweight 0%) and had lower mean hemoglobin (Hb) (P=0.021, underweight 11.3 g/dL, normal weight 11.6 g/dL, overweight 12.1 g/dL) and hematocrit (Hct) levels (P=0.025, underweight 33.7%, normal weight 34.3%, overweight 36.0%). Their dietary intake of protein, iron, magnesium, and folic acid was lower than that of normal weight and overweight women. Their meals tended to include fewer meat, fish, egg, and soybean dishes (underweight, mean of 4.7 servings per day; normal weight, 6.1 servings; overweight, 6.1 servings). **Conclusion** Pregnant women who were underweight before pregnancy had increased risk of anemia as well as reduced Hb and Hct levels. They had lower dietary intake of protein, iron and folic acid compared to women in the other BMI categories. Anemia and these nutrient deficiencies are known risk factors for low birth weight. Our findings suggest the importance of providing underweight pregnant women with support to improve dietary intake during their pregnancy, especially to increase intake of protein and iron through consumption of fish and meat dishes.

PubMed Disclaimer

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Pre-pregnancy BMI classification Characteristics of nutritional status and food intake status of underweight pregnant women

— of — Hayashi
 Uno Kaoru y Yukari Take y,2y Hayashi Mi Fumi 2 y Hosokawa Momo 3^y

Purpose: To determine the differences in the nutritional status and food intake during the second trimester of pregnant women with pre-pregnancy BMI classifications of underweight compared with those of other classifications.

Check if there is. Method: From

January to March 2015, pregnant women (14 to 20 weeks of pregnancy) who visited S Hospital in T City, Gunma Prefecture for prenatal checkups and motherhood classes were invited to participate in the study, and written consent was obtained. A survey was conducted on 141 people. During the prenatal checkup at 20 weeks of pregnancy, we conducted a dietary record for 2 consecutive days (recommended amount method) and a questionnaire survey to obtain medical history, height, pre-pregnancy weight, and blood sample data from the medical records. Of these, 132 women, excluding 9 with severe hyperemesis, were analyzed for nutrient intake, food group intake, and cooking intake by pre-pregnancy BMI category (28 underweight, 93 normal, and 11 obese). Analysis was carried out. For statistical analysis, we used the χ^2 test, Fisher's exact test, Kruskal-Wallis test, and one-way analysis of variance. We also performed covariance analysis after adjusting for age, total energy intake, employment status, etc.

Results: Many pregnant women with pre-pregnancy BMI underweight were employed, had significantly low hemoglobin and hematocrit values, and were at risk of anemia. Regarding nutrient intake, protein, iron, magnesium, and folic acid were significantly lower in underweight subjects than in other BMI categories. Regarding intake status by food group, there was a tendency for meat, fish, eggs, soybean products, etc. to be lower in weight loss, but no significant differences were observed. On the other hand, regarding food intake, underweight subjects ate significantly fewer main dishes. ($P=0.002$, underweight 4.7SV, normal 6.1SV, obese 6.1SV). Conclusion The problem faced by underweight pregnant women in the pre-

pregnancy BMI category is that they have low values for blood test items related to anemia, and in terms of nutritional intake, nutrients involved in hematopoiesis such as protein, iron, and folic acid are lower than in other categories. In particular, the number of main dishes was shown to be low in terms of food intake. These are risk factors or associated factors for low birth weight babies, and pregnant women who are underweight before pregnancy should be supported to gain adequate weight and eat food, especially main foods that reduce the supply of protein and iron. was suggested to be important.

Key words: Pregnant women, anemia, thinness, dietary intake, nutrient intake

Japanese Journal of Public Health 2016; 63(12): 738y749. doi:10.11236/jph.63.12_738

Original Words

It was published in the 1980s that "If a fetus or infant is exposed to undernutrition or overnutrition during conception, fetus, or infancy, a predisposition to lifestyle-related diseases will be formed, and subsequent negative lifestyle habits will be added." In response to the DOHaD theory (theory of the origin of fetal onset of lifestyle-related diseases) [1], there are movements aimed at reducing the proportion of low birth weight babies among all births. Active. In its Global Nutrition Targets 2025 [2], WHO aims to reduce low birth weight by 30% and reduce anemia by 50% among women of reproductive age.

¹Women's University of Nutrition Graduate

School 2 ²Women's University of

Nutrition 3 ³Love's General Incorporated Association

Corresponding author contact information: Kaoru Uno, Food Ecology Laboratory, Women's University of Nutrition, 3-9-21 Chiyoda, Sakado, Saitama 350-0288

The goal is to reduce this. Previous studies

from overseas have pointed to two factors that cause low birth weight babies: preterm birth and intrauterine growth restriction (IUGR) [3-6].

Behind these two factors are medical advances, multiple pregnancies, smoking, low maternal weight before pregnancy, undernutrition, suppressed weight gain during pregnancy, anemia, gestational hypertension, and the presence of gestational diabetes. Yes [4]. Factors related to nutrient intake include micronutrient deficiencies, which have been shown to be associated with premature birth, anemia, and gestational hypertension [5]. Previous studies in Japanese subjects have also shown that maternal short stature, nutritional status (underweight pre-pregnancy BMI, poor gestational weight gain), gestational hypertension [7], smoking, age, multiple pregnancy [8], first birth, and infertility (Treatment [9]) has been cited as a factor in the occurrence of low birth weight babies. In Japan, the number of low birth weight babies is increasing year by year [10].

Healthy Japan 21 (2nd edition) and Healthy Parents and Children 21 (2nd edition) have set a goal of reducing the proportion of low birth weight babies, and countermeasures are required (11,12). In Japan, the "Dietary Guidelines for Expectant and Nursing Mothers" released by the Ministry of Health, Labor and Welfare in 2006 indicated the recommended amount of weight gain during pregnancy based on pre-pregnancy BMI categories (13). However, in a study by Ueda et al. at a hospital in Hyogo Prefecture that showed maternal weight gain over a 15-year period starting in 1988, the average weight gain was 12.0 ± 3.7 kg in 1988, but in 2002 it was $10.0 \pm$ It continues to decrease year by year to 3.9 kg (14). Furthermore, in a study by Murata et al. in 2014 at a hospital in Osaka Prefecture, the weight decreased to 9.6 ± 3.8 kg (15). Furthermore, the proportion of underweight (underweight) women with a BMI of less than 18.5 kg/m² among women of childbearing age is 21.5% in their 20s and 17.6% in their 30s (16). The average birth weight of children announced by the Ministry of Health, Labor and Welfare has decreased from 3.18 kg in 1970 to 3.00 kg in 2012 (10). Based on the above, improving the nutritional status of women of childbearing age is an urgent issue in order to reduce the number of low birth weight babies in Japan.

Previous studies on the nutrient

intake status of pregnant women have longitudinally shown the nutrient intake status during pregnancy using dietary records (17-20), and previous studies focused on some nutrients (20,21). In both cases, it has been pointed out that the intake of energy and various nutrients during pregnancy is insufficient compared to the recommended and guideline amounts for pregnant women as indicated in the dietary intake standards. Furthermore, there are previous studies using food frequency questionnaires (FFQ) (22-24), which have shown insufficient intake of nutrients during pregnancy. However, there is no research that has clarified the characteristics of the dietary habits of pregnant women with a pre-pregnancy BMI classification of underweight. Furthermore, even if it is revealed which nutrients are deficient, this information cannot be immediately put to use when preparing meals or choosing dishes for eating out or preparing ready-made meals. It is necessary to understand issues at the culinary level as well, such as in the Meal Balance Guide for Expectant and Nursing Mothers published in the Maternal and Child Health Handbook, and make recommendations for specific dietary behaviors. Therefore, in

this study, we clarified the characteristics of the nutritional status, nutrient intake status, food group intake status, and cooking intake status of underweight pregnant women according to pre-pregnancy BMI classification, who are particularly likely to give birth to low birth weight babies. with the following purposes:

Research method

1. Subjects

This study used baseline survey data from an intervention study conducted by the authors. The recruitment period is from January to March 2015.

Prenatal checkup and mother at S Hospital, which specializes in obstetrics and gynecology, T City, Gunma Prefecture

The 198 pregnant women (14 to 20 weeks of pregnancy) who visited the parent class were informed that research participants would be provided with a reward and invited them to participate in the study. Of the 156 people who provided written consent (cooperation rate 78.8%), 141 people were surveyed, excluding those who had been indicated by a doctor to have an underlying disease or comorbidities, those who had multiple pregnancies, and those who were planning to transfer to

another hospital. carried out. Survey method and survey contents

Nutritional status At the health checkup at 20 weeks of pregnancy, weight measurements (Tanita MC118) and blood tests were conducted to ascertain the nutritional status. Blood was collected from the cubital vein. White blood cell count (WBC), red blood cell count (RBC), hemoglobin concentration (Hb), hematocrit value (Hct), mean red blood cell count, which is usually ascertained during prenatal checkups, is aimed at understanding nutritional status and anemia status. Nine items were measured: volume (MCV), mean corpuscular pigment content (MCH), mean corpuscular pigment concentration (MCHC), total protein (TP), and albumin concentration (Alb). The measurement methods are: WBC is laser multi-angle polarization scattering dispersion method, RBC is laser two-dimensional photometry analysis, Hb is cyanogen quaternary ammonium salt method, Hct is red blood cell pulse height detection method, TP is Buret method, Alb is BCP. Measured using a modified method. Note that MCV, MCH, and MCHC were calculated from the combination of RBC, Hb, and Hct. In addition to these items, serum 25(OH)D was measured using the RIA antibody method. All measurements were performed at the laboratory department of S Hospital, and medical history, height, pre-pregnancy weight, pre-pregnancy BMI, and blood sample data were obtained from the medical records. The BMI categories were as follows: underweight <18.5 and obese ≥25, as indicated in the "Dietary Guidelines for Expectant

(2) Nutrient intake status, intake status by food group, and cooking intake status Meals

were ascertained through meal records for two consecutive days (recommended amount method), and supplementary photographic records were also used. Dietary records were requested at the 20th week of pregnancy, before the intervention, and confirmed through interviews at the 22nd week of pregnancy. During the interviews, we used a book (25) showing photos and weights as a tool to understand the weight of food and dishes. All interviews were conducted by four registered dietitians, including the principal investigator who had received prior training in the Dietary Survey Manual (26), and quality control and inter-investigator quality control were conducted based on common books (27-29). Aimed at standardization. After coding the obtained meal records based on the food composition table (30), input the data into Excel Nutrition Kun ver. 7.0 (Kenpakusha Co., Ltd.) to calculate the nutritional value and calculate the average nutrient intake status, food, etc. for 2 days. Data on intake status by group was obtained.

The analysis included total energy intake, nutrient intake, food group intake, and food intake for each pre-pregnancy BMI category.

The mean value \pm standard deviation of the intake amount for each category was calculated. For the analysis of each category of food, the number of servings (SV) for staple foods, main dishes, side dishes, fruits, and milk/dairy products was calculated based on the Meal Balance Guide Utilization Manual³¹⁾ and the "Meal Balance Guide Q&A"³²⁾. The SV number was calculated for each cooking category and calculated to the first decimal place. In this study, supplements were excluded because the purpose was to examine the status of nutritional intake from meals. Foods fortified with nutrients were included in intakes.

Eating behavior, eating attitude, food knowledge, and other lifestyle habits etc

A self-administered questionnaire created specifically for this study was used to understand pregnant women's eating behavior, eating attitudes, and food knowledge. Regarding eating behavior, the frequency of skipping breakfast and eating out was categorized into five categories: "almost every day," "4 or 5 times a week," "2 or 3 times a week," "about once a week," and "almost never." Respondents were asked to answer the following questions, and those who answered "almost never" were coded "none," and all others were coded "yes." Furthermore, we ascertained the usage status of supplements and the frequency with which staple foods, main dishes, and side dishes were available. Regarding eating attitudes, Takemi et al.'s nutritional education based on behavioral science and the importance of nutrition, cooking, eating, whether they like or dislike cooking, and their confidence in preparing their meals with nutrition in mind. It was created with reference to the questionnaire used in research on creating a supportive environment³³⁾ and Komaba et al.'s study on meal preparation³⁴⁾. Regarding importance, respondents were asked to answer from "very important" to "not important," and regarding confidence, from "I think I can do it quite well" to "I don't think I can do it at all." "I think I can do it a little bit" was rated "Yes," "I don't think I can do it much," "I don't think I can do it at all" was rated "No," and "I don't think I can do it at all" was rated "Neutral". In terms of knowledge, I learned about the nutrients needed during

pregnancy, the amount and balance of meals that are suitable for you in order to give birth to a healthy baby, the contents of the meal balance guide written in the maternal and child health handbook, and the amount of weight gain you need. The respondents were asked to answer on a five-point scale ranging from "I understand very well" to "I don't understand at all," and those who "understood well" and "somewhat understood" were considered "yes," and the others were considered "no." Furthermore, the participants were asked to freely describe their own appropriate amount of weight gain, and the optimal amount of weight gain set for each pre-pregnancy physique category according to the Ministry of Health, Labor and Welfare's "Optimal Weight Gain Chart during Pregnancy"¹³⁾ was asked. Indicate whether you were able to answer or not. In addition, household composition, employment status, and household income were asked using a questionnaire. Of the 141 people

who underwent a statistical analysis survey, 9 people with severe symptoms of hyperemesis who skipped meals were excluded, leaving 132 people as subjects for analysis. For the analysis, IBM SPSS Statistics²³⁾ (IBM Japan Co., Ltd.) was used, and the significance level was 5% (both

side test). For continuous variables, a distribution with an absolute value of skewness within 2 was judged to be a normal

distribution. For each variable, pre-pregnancy BMI category (underweight, normal)

Differences due to age (e.g., obesity) were examined. For attributes, health status, eating behavior, eating attitude, food knowledge, and other lifestyle habits, the χ^2 test was used for nominal scales, and Fisher's exact test was used when there were 20% or more cells with an expected frequency of less than 5. Kruskal-Wallis test was performed for ordinal scales. Interval/ratio scales for blood data and nutrient intake status were analyzed using one-way analysis of variance and covariance analysis to test the uniformity of the mean values among the three BMI classification groups, and Fisher's constrained LSD Multiple comparisons were performed using the method. Regarding the blood data, we performed a trend test. The adjustment variables for covariance analysis were age and employment status for blood data, and energy intake was added to these for nutrient intake status, food group intake, and cooking intake. Regarding the risk of anemia, based on the WHO anemia criteria for hemoglobin and hematocrit, we performed a χ^2 test on the proportion of anemic patients by pre-pregnancy BMI category. y. Ethical considerations This study complies with the Declaration of Helsinki.

Based on the ethical principles of research [35], we verbally explained to the subjects the purpose of the study, the possibility of voluntary participation and discontinuation, and the protection of personal information, and obtained written consent to participate. The research content was registered and published in the UMIN clinical trial registration system (UMIN trial ID y UMIN00016107), and approved by the Kagawa Nutrition Academy Medical Ethics Review Committee for Experimental Research (No. 340, November 19, 2014).

y Research results

y. Characteristics of subjects (Table

y) The age (mean \pm standard deviation) of all subjects was 31.0 \pm 5.1 years, and the pre-pregnancy BMI (mean \pm standard deviation) was 20.5 \pm 2.9 kg/m². Body weight (mean \pm standard deviation) was 53.2 \pm 8.6 kg. The proportion was 57.6% for first-time mothers, 39.4% for those under 29 years old, and 43.9% for full-time workers. By pre-pregnancy BMI category, she was underweight at 20.6%, normal at 71.0%, and obese at 8.4%. At the baseline survey, body weight was 46.0 \pm 3.8 kg for underweight, 53.4 \pm 6.6 kg for normal, and 69.2 \pm 9.9 kg for obese. Regarding employment status, 16 people (57.1%) were employed full-time in the pre-pregnancy BMI category of underweight (P=0.022). Regarding other attributes, there were no significant differences between BMI categories. Regarding the eating attitudes of underweight pre-pregnancy BMI categories, 28 people (100%) answered that "importance of nutrition" was "very important";

Table 1 Target characteristics

		Overall (n=132) Thin (n=28) Normal (n=93) Obese (n=11) P value				
age a	(age)	31.0±5.1	32.0±4.3	30.8±5.3	30.4±4.8	0.516
height a	(cm)	159.6±5.7	160.8±5.9	159.3±5.5	159.3±6.7	0.473
Pre-pregnancy BMI b	(kg/m ²)	20.1(15.8, 33.2)	17.4(15.8, 18.4)	20.4(18.5, 24.8)	26.1(25.2, 33.2)	
Weight gain at 20 weeks	(kg)	53.2±6.6	48.0±3.8	53.4±6.8	69.2±9.9	0.001
Weight gain up to 20 weeks a (kg)		0.8±2.3	0.9±1.8	0.9±2.2	-0.2±3.7	0.309
First time parity category c	First birth	76(57.6)	14(50.0)	57(61.3)	5(45.5)	0.398
	Multiborn	56(42.4)	14(50.0)	36(38.7)	6(54.5)	
Age c	Under 29 years	52(39.4)	10(35.7)	38(40.9)	4(36.4)	0.912
	Old Over 30 years old	80(60.6)	18(64.3)	55(59.1)	7(63.6)	
Household composition d	Couple only (48.5) Couple and parents or children (45.5) Couple parents and children (6.1)	13(46.4)	48(51.6)	3(27.3)	6(54.5)	0.120
		15(53.6)	39(41.9)	6(54.5)	2(18.2)	
Employment status d	Full-time other	58(43.9)	16(57.1)	40(43.0)	2(18.2)	0.022
		74(56.1)	12(42.9)	53(57.0)	9(81.8)	
Household income d	Less than 2 million yen	9(6.8)	1(3.6)	6(6.5)	2(18.2)	0.513
	2 million to less than 6 million yen	83(62.9) 32	21(75.0)	55(59.1)	7(63.6)	
	6 million yen or more	(24.2) More	5(17.9)	26(28.0)	1(9.1)	
	(8.1) Don't know	1(3.6)	6(6.5)	1(9.1)		
Missing household	none	105(79.5)	21(75.0)	75(80.6)	9(81.8)	0.795
	can be	27(20.5)	7(25.0)	18(19.4)	2(18.2)	
Rating out e	None	84(63.6)	17(60.7)	62(66.7)	5(45.5)	0.360
	Yes	48(36.4)	11(39.3)	31(33.3)	6(54.5)	
Supplement usage status f Yes No		37(28.0)	7(25.0)	29(31.2)	1(9.1)	0.281
		95(72.0)	21(75.0)	64(68.8)	10(90.9)	
Frequency of getting staple food, main dish, and side dishes of more than twice a day g	once a day	37(28.0)	10(35.7)	26(28.0)	1(9.1)	0.224
	once a day	49(37.1)	9(32.1)	33(35.5)	7(63.6)	
	less than once a day	46(34.8)	9(32.1)	34(36.6)	3(27.3)	
Importance of nutrition h	Very important	120(90.9)	28(100.0)	83(89.2)	9(81.8)	0.212
	Very important	12(9.1)	0(0.0)	10(10.8)	2(18.2)	
Importance of cooking i	Very important	92(69.7)	17(60.7)	68(73.1)	7(63.6)	0.411
	Very important	40(30.3)	11(39.3)	25(26.9)	4(36.4)	
Importance of diet c	Very important	112(84.8)	22(78.6)	80(86.0)	10(90.9)	0.188
	Very important	20(15.2)	6(21.4)	13(14.0)	1(9.1)	
I love cooking j	Like	87(65.9)	19(67.9)	61(65.6)	7(63.6)	0.960
	Neutral Dislike	27(20.6)	7(25.0)	16(17.2)	4(36.4)	
		18(13.6)	2(7.1)	16(17.2)	0(0.0)	
Confident in nutrition and meal preparation k	Neutral	75(56.8)	12(42.9)	60(64.5)	3(27.3)	0.008
		26(19.7)	6(21.4)	14(15.1)	6(54.5)	
	none	31(35.7)	10(35.7)	19(20.4)	2(18.2)	
Nutrient knowledge l	None	58(43.9)	12(42.9)	42(45.1)	4(36.4)	0.850
	Yes	74(56.1)	16(57.1)	51(54.8)	7(63.6)	
Knowledge of quantity and balance m	None	60(45.5)	10(35.7)	44(47.3)	6(54.5)	0.457
	Yes	72(54.5)	18(64.3)	49(52.7)	5(45.5)	
Knowledge of meal balance guide No Yes n		90(68.2)	17(60.7)	66(71.0)	7(63.6)	0.561
		42(31.8)	11(39.3)	27(29.0)	4(36.4)	
I understand the appropriate amount of weight gain o	Other	82(62.1)	21(75.0)	57(61.3)	4(36.4)	0.078
		50(37.9)	7(25.0)	36(38.7)	7(63.6)	
Correct or incorrect amount of weight gain p	Correct answer (within range) 37 (28.0) Incorrect answer 95 (72.0)		7(25.0)	20(21.5)	10(90.9)	0.001
			21(75.0)	73(78.5)	1(9.1)	

For numerical values, a is the mean value ± standard deviation, b is the median value (minimum value, maximum value), and cde is the number of people (n).

For comparisons between groups, one-way analysis of variance was used for a, x² test for c, Fisher's exact test for d, and Kruskal-Wallis test for e.

Underweight: BMI<18.5 Obese: BMI≥25

To determine whether weight gain is correct or incorrect, use a questionnaire to ask about your own appropriate amount of weight gain, and check the Ministry of Health, Labor and Welfare's "Optimal Weight Gain Chart during Pregnancy."

It showed whether the respondents were able to answer the weight set for each body size category at the time of pregnancy.

Only 42.9% of respondents answered that they were "confident" won. In terms of knowledge, it is important to know whether the amount of weight gain is correct or incorrect. The correct answer rate for obese people was as high as 90.9%.

On the other hand, the correct answer for those in the pre-pregnancy BMI category of underweight and normal was low at 25.0% for underweight and 21.5% for normal (P<0.001).

y. Blood test data (Table y)

By pre-pregnancy BMI category, as an indicator of anemia

The Hb and Hct used are lower in the order of obese, normal, and thin.

A significant difference was observed in the trend test. all Hb (mean ± standard deviation) of subjects was 11.6 ± 0.8 g/dL. Although not shown in the table, the WHO's anemia determination A total of 34 people had Hb<11.0 g/dL, which is the standard 36). It was 25.8%. People with low Hb values by BMI category

The percentage was 11 underweight, 39.3%, 23 normal, 24.7%, and obese. 0%, 0%, and there are many underweight people with low values. (P=0.038). The overall average of Hct was 34.3±2.3%. Although not shown in the table, the WHO anemia criteria36) There were a total of 36 people with Hct<33%, and 27.3% .

Ta The percentage of people with low values for each BUN category is 10 people who are underweight, 12 people who are underweight, 35.7%, standard 26, 28.0%, obese 0, 0% (P=0.076). Mean serum 25(OH)D was 16.1±5.7 ng/dL, and serum 25(OH)D, which is considered a deficiency criterion37) Those with D<20 ng/dL accounted for 83.6% of the total. pregnancy No differences were observed depending on pre-pregnancy BMI category.

y. Nutrient intake status (Table y)

In pre-pregnancy BMI category underweight, age, employment status covariates, adjusting for total energy intake as a covariate. As a result of analysis of variance, protein, magnesium, iron, The intake of folic acid was shown to be significantly lower than the standard. It was done.

y. Intake status by food group (Table y)

Average food group intake by pre-pregnancy BMI category

As a result of covariance analysis, it was found that underweight people had lower grain intake than obese people. It was significantly less.

y. Food intake status (Table y)

As a result of covariance analysis, pre-pregnancy BMI category of underweight people SV number of main dish (adjusted mean value, 95% lower limit of confidence interval) The upper limit value is 4.7, 4.0-5.4SV, and the standard value (6.1, 5.7-5SV 6.5SV), significantly lower than obesity (6.1, 5.0-7.2SV). There was no (P=0.002). No further significant difference was observed. However, in those with pre-pregnancy BMI category underweight, staple food The SV number also tended to be low (thin 3.3, 2.9y 3.7SV, standard 3.6, 3.4-3.7SV, obesity 4.1, 3.6-4.7SV, P=0.056).

	Underweight		Normal		Obese		P-value
	Mean (SD)	Number (n)	Mean (SD)	Number (n)	Mean (SD)	Number (n)	
Hb (g/dL)	11.6 (0.8)	104	11.6 (0.8)	104	11.6 (0.8)	104	0.853
Hct (%)	34.3 (2.3)	104	34.3 (2.3)	104	34.3 (2.3)	104	0.287
BUN (mg/dL)	16.1 (5.7)	104	16.1 (5.7)	104	16.1 (5.7)	104	0.076
25(OH)D (ng/dL)	16.1 (5.7)	104	16.1 (5.7)	104	16.1 (5.7)	104	0.076
Protein (g)	64.2	104	64.2	104	64.2	104	0.844
Magnesium (mg)	64.2	104	64.2	104	64.2	104	0.859
Iron (mg)	64.2	104	64.2	104	64.2	104	0.812
Folic acid (µg)	64.2	104	64.2	104	64.2	104	0.827
Staple food (SV)	3.3	104	3.3	104	3.3	104	0.056
Main dish (SV)	4.7	104	4.7	104	4.7	104	0.002

Table 7

	Whole			Milk			Compliance		
	(n=132)	Bin (n=28)	Binland (n=33)	C (n=11)	Binland (n=33)	Binland (n=33)	Binland (n=33)	Binland (n=33)	Binland (n=33)
Grains									
Wheat	45,354.1	45,354.1	46,448.9	0.000005					0.177
Barley	107,487.5	107,487.5	107,487.5	0.000007					
Rice	11,641.4	13,041.7	11,341.3	0.000114					0.910
	5,168.8	6,010.5	4,940.0	4.472					0.915
	1,733.7	2,644.9	1,653.5	0.4506					0.236
Legumes	54,062.4	47,548.3	55,748.0	0.000428					0.739
	53,144.5	41,239.8	57,345.6	0.000443					0.195
Vegetables	87,550.1	74,442.2	80,933.7						
	40,534.7	32,628.9	47,234.9	0.000459					0.515
Milk									
Fruits	98,489.6	98,489.6	98,489.6						
	21,942.5	28,942.6	20,342.2	0.000268					0.279
Meat									
Beef	12,211.2	8,249.4	7,927.1	7.6395					0.985
Pork		10,749.0	12,248.3	0.000275					0.357
Chicken		48,820.8	56,327.4	0.000272					0.404

Table 7 Food intake status by BMI category

	Overall (n=132)	One-way analysis of variance				Covariance analysis									
		a thin (n=28)	b standard	c Obesity (n=77) ¹⁾	No type comparison	a thin (n=28)	b standard (n=93)	c Obesity (n=11)	P value	Multiple comparisons					
Energy (kcal)	(SV) 3.6±1.1	3.3±1.2	3.6±1.1	4.1±0.8	0.126	3.3(3.0y3.7)	3.6(3.4y3.7)	4.1(3.6y4.7)	0.056	(SV) 4.6±2.0	4.3±1.6	4.8±2.1	3.3±1.3	0.028	cyb
0.004	4.3(3.6y5.0)	4.8(4.4y5.2)	3.4(2.2y4.5)	0.041	cyb	Side dish (SV) 5.8±2.2	4.8±1.7	6.1±2.3	6.0±2.0	0.005	ayb	4.7(4.0y5.4)	6.1(5.7y6.5)	6.1(4.9y7.2)	
	ayb	Main dish Milk/dairy products (SV) 1.9±1.7	1.9±1.4	1.9±1.8	1.7±1.2	0.951	1.9(1.3y2.6)	1.9(1.5y2.2)	1.6(0.6y2.7)	0.890	Fruit (SV) 0.9±0.8	0.7±0.7	1.0±0.8		
	0.9±0.9	0.259	0.6(0.3y1.0)	1.0(0.8y1.1)	0.9(0.4y1.4)	0.200	Sweets-Favourite drinks (kcal) 148±135	174±136	141±133	150±149	0.513	178(128y224)	144(112y168)		
	144(64y224)	0.415													

Values are the mean ± standard deviation for one-way analysis of variance, and adjusted mean values (95% confidence interval lower limit - upper limit) for covariance analysis, adjusting for age, energy intake, and employment status as covariates. For comparisons between groups, multiple comparisons were performed using Fisher's constrained LSD method, and differences between groups were indicated with an inequality sign. "Standard food" y Dishes whose main ingredients are rice, bread, noodles, pasta, etc., which are sources of carbohydrates. "Side dishes" Main ingredients include vegetables, seaweed, potatoes, beans (excluding soybeans), mushrooms, and seaweed, which are sources of various vitamins, minerals, and dietary fiber. Dishes to do. "Main dish" yk dish whose main ingredients are meat, fish, eggs, soybeans, and soybean products, which are sources of protein.

Consideration

Characteristics of nutritional status in blood data, the average values of anemia-related indicators such as Hb and Hct are lowest in the order of obese, normal, and underweight, indicating that a higher proportion of underweight people meet the WHO anemia criteria. Shown. Anemia is a risk factor for low birth weight babies. According to the WHO Global Nutrition Targets 2025(2,38) and previous studies, anemia is also closely related to perinatal outcomes, and is associated with miscarriage, preterm birth, low birth weight, and intrauterine growth retardation(38, 39). A previous study by Takimoto et al. on Japanese subjects also found that anemia was a problem among Japanese pregnant women, with 22.9% reported to have anemia below the standard of 11.0 g/dL(40). The overall score for this study was 25.8z. Although the previous study by Takimoto et al. did not show the proportion by BMI category, the present study revealed that anemia was significantly higher in pre-pregnancy BMI categories of underweight people, at 39.3z, compared to other categories. The importance of According to another report by Takimoto et al., the proportion of underweight pre-pregnancy BMI categories with anemia in late pregnancy was 76.2%, which is higher than in other pre-pregnancy BMI categories. (41). Furthermore, if the mother is underweight before becoming pregnant, the child's birth weight is low, a phenomenon that is universally observed in all countries. The reason for this is explained to be that the amount of nutrients accumulated in the body, which is the source of nutrients for the fetus, is small(42). The above suggests that it is once again important to maintain a proper weight before pregnancy and prevent malnutrition and anemia.

Characteristics of nutrients, food groups, and dietary intake status This study showed that pre-pregnancy BMI categories of underweight

It was done. Many domestic and international studies have looked at the relationship between pre-pregnancy BMI classification, weight gain, and birth weight of the child, but only a few studies have clarified the status of nutrient intake. Furthermore, no studies have been found that clarify the status of food and cooking intake. Among previous studies in Japan, there are few studies that have used dietary records to analyze each pre-pregnancy BMI category, such as the one by Taniuchi et al. that used dietary records at the end of pregnancy(18) and the one by Sumibara et al. Although there is a study(43) using mid-term dietary records, the dietary issues of pregnant women with pre-pregnancy BMI underweight have not been clarified. In addition, no previous overseas research has clarified the dietary characteristics of thin pregnant women, mainly in Europe and the United States, where obesity is the issue rather than thinness. A study by Derbyshire et al. in the UK showed that prepregnancy BMI was inversely correlated with energy, dietary fiber, iron, folic acid, and vitamin E(44). In this study, we used dietary records of Japanese people during the second trimester to understand the specific dietary intake status of underweight pregnant women in the pre-pregnancy BMI category at the nutritional, food group, and cooking levels. As a result, it became clear that there was a lack of protein intake and main dishes with meat and fish as main ingredients at the cooking level. Regarding nutrients, previous research has listed seven nutrients that are associated with birth outcomes: protein, iron, folic acid, magnesium, calcium, zinc, and vitamin C(45). In this study, the intake of four of these items, protein, iron, folic acid, and magnesium, was significantly lower than the standard in underweight subjects. Anemia includes iron deficiency anemia, folate deficiency anemia, and vitamin B12 deficiency(46). Among the subjects in this study, 28% of the respondents took iron and folic acid supplements to prevent anemia.

A study by Sato et al. also showed that the supplement usage rate among pregnant women was approximately 70%, most of which was folic acid supplements⁴⁷). Many modern supplements for pregnant women contain a combination of folic acid, iron, and calcium. Furthermore, iron supplements are often prescribed in clinical settings⁴⁸).

The eating habits of underweight pregnant women in this pre-pregnancy BMI category are low in nutrients, such as protein, iron, and folic acid, and foods that are high in heme iron tend to be low in meat and fish. It was shown that there were few. Although it may be possible to supplement folic acid and iron with supplements or iron preparations, this suggests the importance of taking main foods as part of the diet, including intake of protein in addition to these nutrients. Regarding the intake of food groups, there was no difference between the three pre-pregnancy BMI categories, but the difference was found in the intake of each food group (meat, seafood, beans, and eggs), which are the main ingredients of the main dish. Although the intake amount was small and the difference by pre-pregnancy BMI category was small, when examining the food level, the difference was considered as the total amount of main dishes, so there was no significant difference. I think it was done. *y*. Implications for dietary support for pregnant women The difference in protein intake between pre-pregnancy BMI categories underweight and other BMI categories

was approximately 6 g. This corresponds to 1SV

of the main dish in the Meal Balance Guide. Based on these results, pregnant women with a pre-pregnancy BMI category of underweight should be advised about the specific amounts and methods of main dishes for 1 SV, such as adding one egg and the serving size of meat and fish. It is possible to specifically tell students what and how to increase the amount of food they eat, such as adding 1 SV worth of protein source ingredients to a complex dish. Regarding the characteristics of the subjects, there were many full-time workers among those in the pre-pregnancy BMI category of underweight. When employed full-time, the time and effort available for preparing meals that involve cooking meat, fish, vegetables,

etc. may be limited. Support that takes into account the characteristics of these lifestyles is necessary.

In addition, in terms of knowledge, there was a significant difference in whether the weight gain was correct or incorrect, with fewer correct answers among those who were underweight or normal in pre-pregnancy BMI category than among those with pre-pregnancy BMI classification obese ($P < 0.001$). The importance of appropriate weight gain is also shown in the "Dietary Guidelines for Expectant and Nursing Mothers"¹³), and the Maternal and Child Health Handbook also includes information for each pre-pregnancy BMI category. A total of 62.1% answered that they "understood" the appropriate amount of weight gain, but only 28.0% answered correctly. In particular, those with a pre-pregnancy BMI classification of underweight or standard have a recommended weight of 7 kg to 9 kg.

Many people indicated the lower limit of the amount of weight increase, making it clear that correct knowledge is not widely available. Many studies^{1,49}) have shown the relationship between a child's birth weight and future risk of lifestyle-related diseases, and it is also necessary to disseminate information regarding appropriate weight gain.

Weight gain during pregnancy is not just about energy, but its content is important; the body size before pregnancy, nutritional status, including the presence or absence of anemia, and the intake of nutrients that affect this affect the birth weight of the child. There is a possibility that The finding in this study that many people with pre-pregnancy BMI underweight were anemic is consistent with previous studies. In addition, the nutrients that pregnant women in the pre-pregnancy BMI category of underweight consumed less than those in other categories, such as protein, iron, and folic acid, are nutrients related to hematopoiesis. Furthermore, main dishes are rich in high-quality protein and are a source of iron. Although this study was a cross-sectional study and it is not possible to conclude a causal relationship between nutrient intake and anemia, it is possible that the dietary contents revealed in this study may increase the risk of anemia. *y*. Limitations of this study A limitation of this study is that the data were only from those who consented to the intervention study, and the

sample size was small because the recruitment period was limited. Furthermore, since the data are from a single facility in Gunma Prefecture, it is difficult to generalize. Furthermore, regarding the dietary survey, there are limitations such as the fact that it was a cross-sectional study that only collected data from the second trimester, the survey was conducted over two days, and the guideline method has accuracy issues when compared to the weighing method⁵⁰). However, by using dietary records, this study showed for the first time that pregnant women in the third trimester who were underweight according to their pre-pregnancy BMI category eat fewer main dishes, and as a result, their meals are low in protein. This demonstrated the necessity of recommending that food be eaten as a main dish, rather than as a component of a meal, rather than recommending individual foods.

Conclusion

Pregnant women in the second trimester of pregnancy whose pre-pregnancy BMI category is underweight have lower Hb and Hct values, which are indicators of anemia, compared to pregnant women in other categories, and are more likely to consume protein sources such as meat, fish, eggs, soybeans, and soybean products. It became clear that there was a shortage of the main ingredient in the dish, that is, the main dish. It was shown that there is a need to specifically convey how to prepare the main dish as a component of a meal.

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Conflict of interest

There are no conflicts of interest (COI) to disclose regarding this research.

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Literature

- 1) Barker DJP, Osmond C. Infant mortality, childhood nutrition, and ischaemic heart disease in England and Wales. *Lancet* 1986; 1(8489): 1077y1081.
- 2) World Health Organization. Global Targets 2025: To Improve Maternal, Infant and Young Child Nutrition. 2014. <http://www.who.int/nutrition/global-target-2025/en/> (accessed November 30, 2015) Possible. 3) World Health Organization. WHA Global Nutrition Targets 2025: Low Birth Weight Policy Brief. 2014. http://www.who.int/nutrition/topics/globaltargets_low-birthweight_policybrief.pdf (accessed November 30, 2015).
- 4) Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013; 382(9890): 427y451.
- 5) Han Z, Mulla S, Beyene J, et al. Maternal under-weight and the risk of preterm birth and low birth weight: a systematic review and meta-analysis. *Int J Epidemiol* 2011; 40(1): 65y101.
- 6) Ramakrishnan U. Nutrition and low birth weight: from research to practice. *Am J Clin Nutr* 2004; 79(1): 17y21.
- 7) Tobai Chiu, Naoko Sakamoto, Naoko Arata, et al. Epidemiological study on maternal factors of low birth weight infants. *Welfare indicators* 2014; 61(1): 1y8.
- 8) Takimoto H, Yokoyama T, Yoshiike N, et al. Increase in low-birth-weight infants in Japan and associated risk factors, 1980–2000. *J Obstet Gynaecol Res* 2005; 31(4): 314y322.
- 9) Honami Yoshida, Noriko Kato, Tetsuji Yokoyama. About long-term changes and factors in birth weight from the perspective of vital statistics. *Health Medical Science* 2014; 63(1): 2y16.
- 10) Maternal and Child Health Study Group. Main statistics on maternal and child health published in 2014. Tokyo: Maternal and Child Health Corporation. 2015; 45: 54-55. 11) Health and Welfare Science Council, Community Health Promotion and Nutrition Subcommittee, Expert Committee for Formulation of the Next National Health Promotion Movement Plan. Reference materials regarding the promotion of Healthy Japan 21 (Second Edition). 2012. http://www.mhlw.go.jp/bunya/kenkou/di/kenkouippon21_02.pdf (accessed November 30, 2015). 12) Ministry of Health, Labor and Welfare/Healthy Parents and Children 21 Promotion Council. Healthy Parents and Children 21 (2nd edition). <http://www.mhlw.go.jp/le/06-Seisakujouhou-11900000-Koyoukintoujoudokateikyoku/0000067539.pdf> (accessible November 30, 2015). 13) 'Healthy Parents and Children 21' Promotion Study Group (Promoting support for pregnant and nursing mothers through Health Support Policy Study Group). Dietary guidelines for pregnant women 'Healthy Parents and Children 21' Promotion Study Group Report. 2006. <http://www.mhlw.go.jp/houdou/2006/02/h0201-3a.html> (accessed November 30, 2015).
- 14) Yasuo Ueda, Yoshi Maruohara, Yoshihiko Ashtaka, et al. Research on the validity of current optimal maternal weight gain standards: Re-evaluation of changes in maternal and infant weight over the 15 years since 1988. *Advances in Obstetrics and Gynecology* 2005; 57(2): 121y130.
- 15) Masaharu Murata, Shiyu Ota, Ryo Yamamoto, et al. Association between weight gain during pregnancy and perinatal events in term singleton pregnancies. *Journal of the Japanese Society of Perinatal and Neonatal Medicine* 2014; 50(3): 995y1000.
- 16) Ministry of Health, Labor and Welfare. 2013 National Health and Nutrition Survey Report. Part 2 Results of physical condition investigation. Table 20 BMI status - by age group, obesity degree (BMI), number of people, percentage - total number, male /female, 15 years or older (excluding pregnant women). 2015. <http://www.mhlw.go.jp/bunya/kenkou/eiyou/h25-houkoku.html> (accessed November 30, 2015).
- 17) Taku Nakano, Keiko Ishii. Survey on the food and nutritional intake of Japanese pregnant and lactating women. *Journal of Nutrition* 2004; 62(2): 103-110. 18) Yoko Taniuchi, Hirohito Sone. Interim analysis of nutrition and pregnancy course in healthy pregnant women. *Journal of Nutrition* 2013; 71(5): 242y252.
- 19) Kubota K, Itoh H, Tasaka M, et al. Changes of maternal dietary intake, bodyweight and fetal growth throughout pregnancy in pregnant Japanese women. *J Obstet Gynaecol Res* 2013; 39(9): 1383y1390. 20) Yuna Watanabe, Hiromi Yoshikata, Hiromi Ishida, et al. Longitudinal study of iron intake and iron nutritional status in pregnant women. *Journal of Nutrition* 2013; 71 (Suppl 1): S26-S38. 21) Kyoko Yoneyama, Junko Ikeda. Effects of calcium and protein intake on changes in bone density during the first and second half of pregnancy. *Japanese Journal of Public Health* 2010; 57(10): 871-880. 22) Yoshie Tsuda, Toshiko Kodera, Eho Takeuchi, et al. On the relationship between high-risk neonatal delivery and the mother's dietary and nutritional status before pregnancy. *Journal of the Japan Society of Home Economics* 2004; 55(12): 945-955. 23) Yuko Sakamoto. Research on bone mass and nutritional management in adult women. *Journal of Nutrition* 2009; 67(4): 186-192. 24) Mie Shiraishi, Megumi Haruna, Masayo Matsuzaki, et al. Nutrient intake and its factors related to breakfast skipping during pregnancy. *Maternal Hygiene* 2009; 50(1): 148-154. 25) Edited by Women's Nutrition University Press. Easy-to-understand energy information: See at a glance the amount of energy you usually eat (3rd edition). Tokyo: Women's Nutrition University Press. 2014. 26) Supervised by the Japanese Society for Nutritional Improvement. Dietary research manual yFrom the first step to practice and application (revised 2nd edition). Tokyo: Nanzando. 2008; 52y79, 150y170.
- 27) Yoshiko Kagawa, ed. Food 80 kilocalorie guidebook! You can see the size and quantity at a glance. Tokyo: Women's Nutrition University Press. 2011. 28) Supervised by Nakako Matsumoto. Basic data for cooking (4th edition). Tokyo: Women's Nutrition University Press. 2012. 29) Miyuki Adachi, Junko Hiritani. Table of ingredients for staple foods, main dishes, and side dishes for meal coordination (3rd edition). Tokyo: Flock sheep

- Company, 2008.
- 30) Ministry of Education, Culture, Sports, Science and Technology Science and Technology Council Resource Survey Subcommittee, ed. Japanese Food Standard Composition Table 2015/Ministry of Education, Culture, Sports, Science and Technology Science and Technology Council Resource Survey Subcommittee Report. Tokyo: National Genome Science Cooperative Association, 2010.
- 31) Japan Dietetic Association, supervised by Yukari Takemi, Nobuo Yoshiike, eds. Practical manual for nutritional education and dietary education using the "Meal Balance Guide" (2nd edition). Tokyo: Daiichi Publishing, 2011. 32)
- Ministry of Agriculture, Forestry and Fisheries. "Meal Balance Guide" Q & A, 2008. http://www.ma3.go.jp/balance_guide/bf_use/pdf/qa_all.pdf (accessed November 30, 2015). 33) Yukari Takemi. Research on the formation of desirable eating habits among local residents through nutritional education based on behavioral science and the creation of a supportive environment. FY2002 Health, Labor and Welfare Scientific Research Grant (Health Science Comprehensive Research Project) Report Research on the formation of desirable eating habits among local residents through nutritional education based on behavioral science and the creation of a supportive environment (Chief researcher: Yukari Takemi) 2003; 1y14. 34) Chikako Komaba, Yukari Takemi, Akemi Nakanishi, et al. Development of a questionnaire to measure the "meal preparation ability" of female university students; Study targeting female university students majoring in nutrition. *Journal of Nutrition* 2014; 72(1): 21y3244)
- 35) World Medical Association. Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects (Japan Medical Association, translation). <http://dl.med.or.jp/dl-med/wma/helsinki2013.pdf> (accessed October 6, 2016). 36) World Health Organization.
- mia: Assessment, Prevention and Control: A Guide for Program Managers. Geneva: World Health Organization, 2001. http://www.who.int/nutrition/publications/micronutrients/anaemia_iron_deficiency/WHO_NHD_01.3/en/ (accessed October 6, 2016). 37) Toshimi Michigami. Vitamin D Update. *Journal of the Japanese Society of Breastfeeding* 2015; 9(1): 33y41.
- 38) World Health Organization. Global Nutrition Targets 2025: Anaemia Policy Brief, 2014. http://www.who.int/nutrition/publications/globaltargets2025_policybrief_anaemia/en/ (accessed October 6, 2016). 39) Haider BA, Olo'n I, Wang M, et al. Anaemia, prenatal iron use, and risk of adverse pregnancy outcomes: systematic review and meta-analysis. *BMJ* 2013; 346: f3443.
- 40) Takimoto H, Yoshiike N, Katagiri A, et al. Nutritional status of pregnant and lactating women in Japan: a comparison with non-pregnant/non-lactating controls in the National Nutrition Survey. *J Obstet Gynaecol Res* 2003; 29(2): 96-103. 41) Hidemi Takimoto, Hideoki Fukuoka, Takashi Sugiyama, et al. Relationship between maternal weight gain during pregnancy and pregnancy outcome. FY2004-2008 Health, Labor and Welfare Scientific Research Grant (Children and Families Comprehensive Research Project) Comprehensive Research Report Is it okay for young women to continue eating as they are? Nutrition and preventive medicine that take into account the health of the next generation (Principal researcher: Nobuo Yoshiike) 2007; 56-71. <http://www.aiku.or.jp/~doc/houkoku/h18/73075030.pdf> (accessed on April 14, 2016). 42) Hidemi Takimoto. Obesity and thinness: Young women's desire to become thinner and their diet issues in health education. *Public Health* 2010; 74(6): 486y491.
- 43) Kayo Sumibara. Actual status of nutritional intake of pregnant women in the second trimester using the weighing method. *Maternal Hygiene* 2009; 50(1): 155y164.
- 44) Derbyshire E, Davies J, Costarelli V, et al. Prepregnancy body mass index and dietary intake in the first trimester of pregnancy. *J Hum Nutr Diet* 2006; 19(4): 267y273.
- 45) Abu-Saad K, Fraser D. Maternal nutrition and birth outcomes. *Epidemiol Rev* 2010; 32: 5y25. 46) Hisao Ogura. Anemia. *Medical Practice* 2003; 20(9): 1537y1539.
- 47) Yoko Sato, Tomoko Nakanishi, Tsuyoshi Chiba, et al. National internet survey on folic acid intake behavior to reduce the risk of neural tube defects in pregnant women. *Japanese Journal of Public Health* 2014; 61(7): 321-332. 48) Japanese Society of Obstetrics and Gynecology. *Japan Society of Obstetrics and Gynecology. Obstetrics and Gynecology Practice Guidelines Obstetrics Edition 2014*. Tokyo: Japan Society of Obstetrics and Gynecology. 2014; 263.
- 49) Barker D.J.P. Fetal origins of coronary heart disease. *BMJ* 1995; 311(6998): 171y174.
- 50) Satoshi Sasaki. Easy-to-understand EBN and nutritional epidemiology. *Tokyo Dobun Shoin*. 2005; 109y150.

Nutritional status and dietary intake among pregnant women in relation to pre-pregnancy body mass index in Japan

Kaoru UNO^y, Yukari TAKEMI^{y,2y}, Fumi HAYASHI² and Momo HOSOKAWA^{3 y}

Key words pregnant women, anemia, underweight, dietary intake, nutrient intake

Objective The present study examined nutritional status and dietary intake of pregnant women in Japan in relation to pre-pregnancy body mass index (BMI).

Methods Participants included 141 Japanese women with singleton pregnancies, from the outpatient department of the S hospital, Gunma prefecture, Japan. Two-day food records, dietary assessment questionnaires, and clinical records were obtained at 20 weeks gestation. Nine patients were excluded from the study due to morning sickness. The remaining 132 participants were divided into 3 groups according to pre-pregnancy BMI: underweight, normal weight, and overweight. Nutritional status and dietary intake were analyzed in relation to BMI using the chi-square test, Fisher's exact test, Kruskal-Wallis test, one-way analysis of variance, and analysis of covariance with adjustment for age, employment status, and total energy intake.

Results Women who were underweight before pregnancy were more frequently working full-time than normal weight and overweight women. Underweight women were also more frequently anemic ($P = 0.038$, underweight 39.3%, normal weight 24.7%, overweight 0%) and had lower mean hemoglobin (Hb) ($P=0.021$, underweight 11.3 g/dL, normal weight 11.6 g/dL, overweight 12.1 g/dL) and hematocrit (Hct) levels ($P=0.025$, underweight 33.7%, normal weight 34.3%, overweight 36.0%).

Their dietary intake of protein, iron, magnesium, and folic acid was lower than that of normal weight and overweight women. Their meals tended to include fewer meat, fish, egg, and soybean dishes (underweight, mean of 4.7 servings per day; normal weight, 6.1 servings; overweight, 6.1 servings).

Conclusion Pregnant women who were underweight before pregnancy had increased risk of anemia as well as reduced Hb and Hct levels. They had lower dietary intake of protein, iron and folic acid compared to women in the other BMI categories. Anemia and these nutrient deficiencies are known risk factors for low birth weight. Our findings suggest the importance of providing underweight pregnant women with support to improve dietary intake during their pregnancy, especially to increase intake of protein and iron through consumption of fish and meat dishes.

^yGraduate School of Kagawa Nutrition University 2 ^yKagawa Nutrition University 3 ^yLuvelli, Inc.