

Supplementary Materials

| Supplementary Table 1. Number of women included in analysis by lifestyle behavioral factor. | | | | | | | | | |
|--|---------------|--------|-----|---|--------|-----|---|--------|-----|
| Lifestyle behaviors | Main analysis | | | Restricted to women with < 5 years since last birth | | | Restricted to women living with children < 18 years | | |
| | Total | No GDM | GDM | Total | No GDM | GDM | Total | No GDM | GDM |
| Diet | | | | | | | | | |
| Fruit and berries | 7511 | 7386 | 125 | 2500 | 2417 | 83 | 6444 | 6333 | 111 |
| Vegetables | 7509 | 7384 | 125 | 2499 | 2417 | 82 | 6447 | 6335 | 112 |
| Red meat | 7551 | 7425 | 126 | 2513 | 2430 | 83 | 6479 | 6367 | 112 |
| Fatty fish | 7518 | 7392 | 126 | 2504 | 2421 | 83 | 6453 | 6341 | 112 |
| Lean fish | 7512 | 7386 | 126 | 2500 | 2417 | 83 | 6447 | 6335 | 112 |
| Total fish | 7522 | 7396 | 126 | 2504 | 2421 | 83 | 6455 | 6343 | 112 |
| Beverages with added sugar | 7477 | 7352 | 125 | 2486 | 2404 | 82 | 6425 | 6313 | 112 |
| Alcohol | 6909 | 6789 | 120 | 2243 | 2166 | 77 | 5909 | 5803 | 106 |
| Physical activity | 6278 | 6185 | 93 | 1977 | 1918 | 59 | 5376 | 5292 | 84 |
| Current smoker | 7531 | 7405 | 126 | 2503 | 2420 | 83 | 6464 | 6352 | 112 |
| Sleep | | | | | | | | | |
| Sleep duration | 7405 | 7279 | 126 | 2453 | 2370 | 83 | 6371 | 6259 | 112 |
| Daytime dysfunction | 7434 | 7311 | 123 | 2470 | 2389 | 81 | 6394 | 6283 | 111 |
| Lifestyle perception | | | | | | | | | |
| Healthy lifestyle importance | 7502 | 7376 | 126 | 2496 | 2413 | 83 | 6440 | 6328 | 112 |
| Lifestyle satisfaction | 7495 | 7370 | 125 | 2494 | 2411 | 83 | 6433 | 6322 | 111 |
| Abbreviations: GDM=gestational diabetes mellitus | | | | | | | | | |

| Supplementary Table 2. Outcome variable categorization and basis of definition | | | | |
|---|--|--|--|---|
| VARIABLE NAME | Questions HUNT4 | Questions MHH | Dichotomization | BASIS OF CATEGORIZATION |
| DIET (Based on Norwegian food-based dietary guidelines (NFBDG)) | | | | |
| Fruit and berries | How often do you eat the following food groups per week: Fruit and berries?* < once, 1-3 times, 4-6 times, ≥ 7 times | How many times per week and how much did you eat of the following? <i>Large fruit, medium fruit, small fruit and berries.</i> | a) ≥ 7 times per week b) < 7 times per week | <i>Recommended in NFBDG:</i> 250g fruit and/or berries every day (1). |
| Vegetables | How often do you eat the following food groups per week: Vegetables?* < once, 1-3 times, 4-6 times, ≥ 7 times | How many times per week and how much did you eat of the following? <i>Garlic, onion, tomato, tomato sauce, mixed salad and other vegetables.</i> | a) ≥ 7 times per week b) < 7 times per week | <i>Recommended in NFBDG:</i> 250g vegetables every day (1). |
| Red meat (Beef, pork, lamb, game) | How often do you eat the following food groups per week: Red meat?* < once, 1-3 times, 4-6 times, ≥ 7 times | How many times per week and how much did you eat of the following? <i>Unprocessed red meat and processed red meat.</i> | a) ≤ 3 times per week b) ≥ 4 times per week | <i>Recommended in NFBDG:</i> 500g per week à 2-3 dinners and some on bread (1). |
| Lean fish (E.g. cod, pollock) | How often do you eat the following food groups per week: Lean fish?* < once, 1-3 times, 4-6 times, ≥ 7 times | How many times per week and how much did you eat of the following? <i>Lean fish</i> | a) ≥ 1 time per week b) < 1 time per week | <i>Recommended in NFBDG:</i> Fish for dinner 2-3 times per week. Approximately 300-450 grams fish per week. At least 200g should be fatty fish(1). |
| Fatty fish (E.g. salmon, trout, herring, mackerel, haddock on bread/for dinner) | How often do you eat the following food groups per week: Fatty fish?* < once, 1-3 times, 4-6 times, ≥ 7 times | How many times per week and how much did you eat of the following? <i>Fatty fish</i> | a) ≥ 1 time per week b) < 1 time per week | |
| Total fish | | | a) ≥ 1 time per week b) < 1 time per week | Score a) on “lean fish” and/or “fatty fish” was set as “healthy intake” |

| | | | | |
|--|--|--|--|--|
| Alcohol | Total alcohol units per week | How many times per week and how much did you drink of the following? <i>Beer and wine with alcohol, and liquor.</i> | a) ≤ 7 units per week b) > 7 units per week | <i>Recommended in NFBDG and Nordic guidelines:</i> Intake should not exceed 10g (1 unit per day) for women (1). 1 unit is defined as 12 g alcohol corresponding to the alcohol content in one bottle of beer (330mL), one glass of wine (120mL), or one drink with liquor (40mL). The definition of a unit varies in different countries from approximately 8-12g. |
| Beverages with added sugar (Soda/squashes, juice, etc.) | How many glasses/cups of the following drinks do you usually drink/eat? <i>Soda/squashes/juice with sugar</i> | How many times per week and how much did you drink of the following? <i>Soda/squashes/juice and other beverages with added sugar.</i> | a) Never/rare b) ≥ 1 glass per week | <i>Recommended in NFBDG:</i> Limit the intake of beverages and foods with added sugar to less than 10% of total energy intake (1). |
| Smoking | What is your smoking status? | | a) Never or former daily/-occasionally b) Current daily/-occasionally | |
| Physical activity Moderate intensity (Fast gait, hard housework or other activity which makes one short of breath) High intensity (Jogging, cross-country skiing or other activities that makes one very short of breath) | How hard do you exercise? (average) How many times per week do you exercise? For how long do you exercise each time? | How many times per week were you physical active at moderate intensity and for how long? How many times per week were you physical active at high intensity and for how long? | a) < 500 MET per week b) ≥ 500 MET per week | The metabolic equivalent of task (MET) is the objective measure of the ratio of the rate at which a person expends energy, relative to the mass of that person. Moderate intensity gives at least 3 MET per minute and high intensity at least 6 MET per minute. Weekly MET was calculated by combining weekly MET of moderate and high intensity exercise: Mod. intensity: Times per week * minutes per time * 3 High intensity: Times per week * minutes per time * 6 <i>Recommended is approximately > 500 MET per week, but > 900 MET is favorable (2).</i> |

| | | | | |
|---|--|---|---|--|
| Sleep duration | How many hours of sleep do you get per night on a normal everyday: | How many hours of sleep do you get per night on a normal everyday/per 24 hours: | a) > 6 hours per night b) ≤ 6 hours per night | <i>Recommended in guidelines and similar Norwegian research:</i> > 6 hours of sleep per night is considered healthy, but 8-9 hours is preferable (3). |
| Daytime dysfunction due to insomnia | How often do you function poorly during day (socially/at work) due to insomnia? | How do you perceive your sleep quality lately: | HUNT: a) Never/rarely/sometimes b) ≥ 3 times per week MHH: a) (Very) good/median b) Bad/very bad | |
| Lifestyle importance | How important is it for you to live healthy? | How important is it for you to live healthy? (scale 1-5) | HUNT: a) (Very) important b) Less/not important MHH: a) ≥4 b) <4 | |
| Lifestyle satisfaction | How satisfied are you with your own lifestyle (diet, physical activity, smoking- and drinking habits)? | How satisfied are you with your own lifestyle (diet, physical activity, smoking- and drinking habits)? (scale 1-5) | HUNT: a) Satisfied /very satisfied b) Less/not satisfied MHH: a) ≤2 b) >2 | |
| <p>Alternative a) is the measure set as “healthy” in our study. Cut off as close as possible to recommendations mentioned. Alternative b) is the measure set as “unhealthy” in our study. Cutoff as close as possible to recommendations mentioned. * Amount unknown</p> <ol style="list-style-type: none"> 1. Kostrådene. Helsedirektoratet. [citation 19. april 2022]. Available at: https://www.helsedirektoratet.no/faglige-rad/kostradene-og-naeringsstoffer/kostrad-for-befolkningen 2. Kaminsky LA, Montoye AHK. Physical Activity and Health: What Is the Best Dose? J Am Heart Assoc. 3(5):e001430. 3. Johnsen MT, Wynn R, Bratlid T. Optimal Sleep Duration in the Subarctic with Respect to Obesity Risk. PLoS ONE. 15. februar 2013;8(2):e56756. | | | | |

| Supplementary Table 3. Sensitivity analysis restricted to women with < 5 years since last birth. Unhealthy lifestyle behaviors and lifestyle perceptions in HUNT4 participants with a history of GDM relative to women without GDM. | | | | | | | |
|---|--------------------------|-----------------------|---------|------|------------------|------|------------------|
| | No history of GDM, n (%) | History of GDM, n (%) | p-value | OR | Model 1 (95% CI) | OR | Model 2 (95% CI) |
| Lifestyle behaviors | | | | | | | |
| Diet | | | | | | | |
| Fruit and berries (<7 times/week) | 1845 (76.3) | 67 (80.7) | 0.35 | 1.30 | (0.75-2.26) | 1.27 | (0.72-2.34) |
| Vegetables (<7 times/week) | 1729 (71.5) | 62 (75.6) | 0.42 | 1.23 | (0.74-2.06) | 1.22 | (0.72-2.06) |
| Red meat (\geq 4 times/week) | 334 (13.7) | 11 (13.3) | 0.90 | 0.96 | (0.50-1.83) | 0.94 | (0.49-1.82) |
| Fatty fish (<1 times/week) | 882 (36.4) | 29 (34.9) | 0.78 | 0.94 | (0.59-1.48) | 0.90 | (0.57-1.43) |
| Lean fish (<1 times/week) | 1058 (43.8) | 37 (44.6) | 0.88 | 1.03 | (0.67-1.60) | 1.06 | (0.68-1.66) |
| Total fish (<1 times/week) | 591 (24.4) | 21 (25.3) | 0.85 | 1.05 | (0.63-1.74) | 1.04 | (0.63-1.74) |
| Beverages with added sugar (\geq 1 glass/week) | 1258 (52.3) | 38 (46.3) | 0.29 | 0.79 | (0.51-1.22) | 0.80 | (0.51-1.26) |
| Alcohol ($>$ 7 units/week) | 16 (0.7) | 1 (1.3) | 0.58 | 1.77 | (0.23-13.51) | 1.78 | (0.22-14.22) |
| Physical activity (<500 MET/week) | 934 (48.7) | 34 (57.6) | 0.18 | 1.43 | (0.85-2.42) | 1.36 | (0.80-2.31) |
| Current smoker | 161 (6.7) | 9 (10.8) | 0.14 | 1.71 | (0.84-3.47) | 1.51 | (0.72-3.17) |
| Sleep | | | | | | | |
| Sleep duration (<6 hours/night) | 220 (9.2) | 6 (7.2) | 0.53 | 0.76 | (0.33-1.77) | 0.66 | (0.28-1.54) |
| Daytime dysfunction | 103 (4.3) | 3 (3.7) | 0.79 | 0.85 | (0.26-2.75) | 0.85 | (0.26-2.76) |
| Lifestyle perception | | | | | | | |
| Healthy lifestyle not important | 167 (6.9) | 11 (13.3) | 0.03 | 2.05 | (1.07-3.95) | 1.98 | (1.00-3.91) |
| Not satisfied with own lifestyle | 849 (35.2) | 40 (48.2) | 0.02 | 1.71 | (1.10-2.65) | 1.70 | (1.09-2.66) |
| Data presented as odds ratio (OR) with 95% confidence interval (95% CI). | | | | | | | |
| Abbreviations: GDM=gestational diabetes mellitus; MET=Metabolic Equivalent of Task. | | | | | | | |
| Model 1 is unadjusted, model 2 is adjusted for age, birth country, cohabitant status, education, parity and time since last birth. | | | | | | | |

| Supplementary Table 4. Sensitivity analysis restricted to women living with children < 18 years. Unhealthy lifestyle behaviors and lifestyle perceptions in HUNT4 participants with a history of GDM relative to women without GDM. | | | | | | | |
|---|--------------------------|-----------------------|---------|------|------------------|------|------------------|
| | No history of GDM, n (%) | History of GDM, n (%) | p-value | OR | Model 1 (95% CI) | OR | Model 2 (95% CI) |
| Lifestyle behaviors | | | | | | | |
| Diet | | | | | | | |
| Fruit and berries (<7 times/week) | 4882 (77.1) | 90 (81.1) | 0.32 | 1.27 | (0.79-2.06) | 1.28 | (0.78-2.08) |
| Vegetables (<7 times/week) | 4584 (72.4) | 88 (78.6) | 0.15 | 1.40 | (0.89-2.21) | 1.42 | (0.89-2.26) |
| Red meat (≥ 4 times/week) | 790 (12.4) | 13 (11.6) | 0.80 | 0.93 | (0.52-1.66) | 0.84 | (0.47-1.52) |
| Fatty fish (<1 times/week) | 2325 (36.7) | 44 (39.3) | 0.57 | 1.12 | (0.76-1.64) | 1.12 | (0.76-1.66) |
| Lean fish (<1 times/week) | 3126 (49.3) | 51 (45.5) | 0.42 | 0.86 | (0.59-1.25) | 0.98 | (0.67-1.43) |
| Total fish (<1 times/week) | 1663 (26.2) | 33 (29.5) | 0.44 | 1.18 | (0.78-1.77) | 1.25 | (0.83-1.90) |
| Beverages with added sugar (≥ 1 glass/week) | 3059 (48.5) | 47 (42.0) | 0.17 | 0.77 | (0.53-1.12) | 0.69 | (0.47-1.01) |
| Alcohol (> 7 units/week) | 76 (1.3) | 2 (1.9) | 0.61 | 1.45 | (0.35-5.98) | 1.87 | (0.44-7.88) |
| Physical activity (<500 MET/week) | 2202 (41.6) | 45 (53.6) | 0.03 | 1.62 | (1.05-2.49) | 1.30 | (0.84-2.03) |
| Current smoker | 541 (8.5) | 14 (12.5) | 0.14 | 1.53 | (0.87-2.70) | 1.65 | (0.90-2.99) |
| Sleep | | | | | | | |
| Sleep duration (<6 hours/night) | 500 (8.0) | 4 (3.6) | 0.09 | 0.43 | (0.16-1.16) | 0.35 | (0.13-0.97) |
| Daytime dysfunction | 270 (4.3) | 5 (4.5) | 0.92 | 1.05 | (0.42-2.60) | 1.05 | (0.42-2.62) |
| Lifestyle perception | | | | | | | |
| Healthy lifestyle not important | 378 (6.0) | 14 (12.5) | <0.01 | 2.25 | (1.27-3.97) | 1.95 | (1.08-3.51) |
| Not satisfied with own lifestyle | 1840 (29.1) | 48 (43.2) | <0.01 | 1.86 | (1.27-2.71) | 1.57 | (1.07-2.32) |
| Data presented as odds ratio (OR) with 95% confidence interval (95% CI). | | | | | | | |
| Abbreviations: GDM=gestational diabetes mellitus; MET=Metabolic Equivalent of Task. | | | | | | | |
| Model 1 is unadjusted, model 2 is adjusted for age, birth country, cohabitant status, education, parity and time since last birth. | | | | | | | |

Supplementary Table 5. Sensitivity analysis including women with diagnosis of hypertension, CVD or diabetes and women with self-reported use of cholesterol lowering medication. Unhealthy lifestyle behaviors and lifestyle perception in HUNT4 participants with prior GDM relative to women without GDM.

| | No History of GDM, n (%) | History of GDM, n (%) | p-value | Model 1 | | Model 2 | |
|--|--------------------------|-----------------------|---------|---------|-------------|---------|-------------|
| | | | | OR | (95% CI) | OR | (95% CI) |
| Lifestyle behaviors | | | | | | | |
| Diet | | | | | | | |
| Fruit and berries (<7 times/week) | 6148 (77.0) | 144 (80.9) | 0.22 | 1.27 | (0.87-1.85) | 1.30 | (0.89-1.91) |
| Vegetables (<7 times/week) | 5773 (72.3) | 142 (79.8) | 0.03 | 1.51 | (1.04-2.18) | 1.56 | (1.07-2.28) |
| Red meat (≥4 times/week) | 1002 (12.5) | 24 (13.4) | 0.71 | 1.09 | (0.70-1.68) | 1.00 | (0.64-1.55) |
| Fatty fish (<1 times/week) | 2930 (36.7) | 73 (40.8) | 0.26 | 1.19 | (0.88-1.61) | 1.22 | (0.90-1.65) |
| Lean fish (<1 times/week) | 3898 (48.8) | 90 (50.3) | 0.7 | 1.06 | (0.79-1.43) | 1.21 | (0.89-1.63) |
| Total fish (<1 times/week) | 2101 (26.3) | 60 (33.5) | 0.03 | 1.41 | (1.03-1.94) | 1.54 | (1.12-2.12) |
| Beverages with added sugar (≥ 1 glass/week) | 3738 (47.0) | 71 (39.9) | 0.06 | 0.75 | (0.55-1.01) | 0.69 | (0.50-0.94) |
| Alcohol (> 7 units/week) | 100 (1.4) | 2 (1.2) | 0.85 | 0.88 | (0.21-3.58) | 1.13 | (0.27-4.67) |
| Physical activity (<500 MET/week) | 2759 (41.4) | 70 (54.7) | 0.003 | 1.71 | (1.20-2.42) | 1.41 | (0.98-2.01) |
| Current smoker | 741 (9.3) | 21 (11.7) | 0.26 | 1.30 | (0.82-2.07) | 1.38 | (0.85-2.23) |
| Sleep | | | | | | | |
| Sleep duration (<6 hours/night) | 648 (8.2) | 14 (7.9) | 0.86 | 0.95 | (0.55-1.65) | 0.82 | (0.47-1.43) |
| Daytime dysfunction | 349 (4.4) | 12 (6.9) | 0.12 | 1.59 | (0.88-2.89) | 1.59 | (0.87-2.92) |
| Lifestyle perception | | | | | | | |
| Healthy lifestyle not important | 483 (6.1) | 18 (10.1) | 0.03 | 1.73 | (1.06-2.85) | 1.58 | (0.95-2.62) |
| Not satisfied with own lifestyle | 2326 (29.2) | 83 (46.9) | <0.001 | 2.14 | (1.59-2.89) | 1.88 | (1.39-2.55) |
| Data presented as odds ratio (OR) with 95% confidence interval (95% CI). | | | | | | | |
| Abbreviations: GDM=gestational diabetes mellitus; MET=Metabolic Equivalent of Task. | | | | | | | |
| Model 1 is unadjusted, model 2 is adjusted for age, birth country, cohabitant status, education, parity and time since last birth. | | | | | | | |