

ELECTRONIC SUPPLEMENTARY DATA

Title

Association between Meal Frequency and Type 2 Diabetes Mellitus in Rural Adults: A Large-Scale Cross-Sectional Study

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Conflict of interest: All authors declare that they have no conflict of interest.

Ethics approval:

Ethics approval was obtained from the “Zhengzhou University Life Science Ethics Committee”, and written informed consent was obtained for all participants. Ethic approval code: [2015] MEC (S128).

Consent to participant

Written consent was acquired from each participant prior to this study.

Supplemental Table S1. Multivariate-adjusted *ORs* and *95% CI* for T2DM according to meal frequency

OR: odds ratio; CI: confidence interval

| Variables | OR (95% CI) | | |
|-----------------------------|------------------|------------------|------------------|
| | Model 1 | Model 2 | Model 3 |
| Total meal frequency | | | |
| 21 times/week (n=26,621) | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) |
| 14-20 times/week (n=2784) | 0.56 (0.47-0.66) | 0.82 (0.68-0.97) | 0.73 (0.60-0.87) |
| Breakfast frequency | | | |
| 7 times/week (n=27,359) | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) |
| 0-6 times/week (n=2046) | 0.54 (0.44-0.66) | 0.86 (0.69-1.05) | 0.82 (0.66-1.01) |
| Lunch frequency | | | |
| 7 times/week (n=29,195) | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) |
| 0-6 times/week (n=210) | 0.80 (0.45-1.30) | 1.02 (0.57-1.67) | 0.92 (0.50-1.55) |
| Dinner frequency | | | |
| 7 times/week (n=28,621) | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) |
| 0-6 times/week (n=784) | 0.57 (0.41-0.77) | 0.70 (0.50-0.95) | 0.59 (0.42-0.81) |

Model 1 was unadjusted;

Model 2 was adjusted for age and gender;

Model 3 was adjusted for age and gender, marital status, average monthly income, education level, smoking status, drinking status, physical activity, vegetable and fruit intake, high-fat diet, high-salt diet, BMI, energy intake, basal metabolic rate, family history of T2DM, weekly frequency of eating-out (total meal, breakfast, lunch, dinner).

Supplemental Table S2. Stratified analysis of the association between total meal frequency and T2DM

| Variables | Weekly total meal frequency | | | <i>P</i> interaction |
|-----------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|----------------------|
| | 21 times/week (<i>n</i> =26,621) | 16-20 times/week (<i>n</i> =1440) | 14-15 times/week (<i>n</i> =1344) | |
| Gender | | | | 0.108 |
| Men | 1.00 (Ref.) | 0.84 (0.59-1.18) | 0.70 (0.47-1.00) | |
| Women | 1.00 (Ref.) | 0.65 (0.45-0.91) | 0.71 (0.49-0.98) | |
| Age | | | | 0.136 |
| < 60 years | 1.00 (Ref.) | 0.85 (0.63-1.13) | 0.83 (0.61-1.12) | |
| ≥ 60 years | 1.00 (Ref.) | 0.75 (0.45-1.17) | 0.60 (0.36-0.94) | |
| BMI | | | | 0.027 |
| 18.5-23.9 kg/m ² | 1.00 (Ref.) | 0.74 (0.42-1.22) | 0.46 (0.23-0.84) | |
| 24.0-27.9 kg/m ² | 1.00 (Ref.) | 0.68 (0.45-0.99) | 0.60 (0.38-0.89) | |
| ≥ 28 kg/m ² | 1.00 (Ref.) | 0.90 (0.59-1.33) | 1.00 (0.67-1.45) | |
| Smoking status | | | | 0.016 |
| Non-smoker | 1.00 (Ref.) | 0.73 (0.54-0.97) | 0.59 (0.42-0.82) | |
| Smoker | 1.00 (Ref.) | 0.77 (0.49-1.18) | 0.88 (0.58-1.30) | |
| Drinking status | | | | 0.367 |
| Non-drinker | 1.00 (Ref.) | 0.65 (0.47-0.88) | 0.71 (0.52-0.95) | |
| Drinker | 1.00 (Ref.) | 0.96 (0.63-1.43) | 0.71 (0.43-1.12) | |
| High-fat diet | | | | 0.556 |
| No | 1.00 (Ref.) | 0.74 (0.55-0.97) | 0.73 (0.54-0.96) | |
| Yes | 1.00 (Ref.) | 0.78 (0.45-1.29) | 0.62 (0.34-1.06) | |
| High-salt diet | | | | 0.072 |
| No | 1.00 (Ref.) | 0.79 (0.59-1.03) | 0.62 (0.45-0.82) | |
| Yes | 1.00 (Ref.) | 0.62 (0.34-1.06) | 1.11 (0.66-1.79) | |
| Vegetable and fruit intake | | | | 0.904 |
| Non-abundant | 1.00 (Ref.) | 0.77 (0.55-1.06) | 0.71 (0.50-0.98) | |
| Abundant | 1.00 (Ref.) | 0.71 (0.48-1.01) | 0.69 (0.46-1.01) | |

Full-adjusted model for age, gender, marital status, average monthly income, education level, smoking status, drinking status, physical activity, vegetable and fruit intake, high-fat diet, high-salt diet, BMI, energy intake, basal metabolic rate, family history of T2DM, weekly frequency of eating out

Supplemental Table S3. Stratified analysis of the association between dinner frequency and T2DM

| Variables | Dinner frequency | | | <i>P</i> interaction |
|-----------------------------------|-------------------------------------|------------------------------------|------------------------------------|----------------------|
| | 7 times/week (<i>n</i> =28,621) | 3-6 times/week (<i>n</i> =463) | 0-2 times/week (<i>n</i> =321) | |
| Gender | | | | 0.852 |
| Men | 1.00 (Ref.) | 1.04 (0.56-1.79) | 0.11 (0.01-0.49) | |
| Women | 1.00 (Ref.) | 0.45 (0.22-0.81) | 0.71 (0.40-1.19) | |
| Age | | | | 0.234 |
| < 60 years | 1.00 (Ref.) | 0.89 (0.51-1.43) | 0.48 (0.20-0.96) | |
| ≥ 60 years | 1.00 (Ref.) | 0.57 (0.24-1.17) | 0.61 (0.28-1.18) | |
| BMI | | | | 0.117 |
| 18.5-23.9 kg/m ² | 1.00 (Ref.) | 0.29 (0.05-0.93) | 0.48 (0.11-1.32) | |
| 24.0-27.9 kg/m ² | 1.00 (Ref.) | 0.62 (0.29-1.16) | 0.44 (0.17-0.94) | |
| ≥ 28 kg/m ² | 1.00 (Ref.) | 0.94 (0.49-1.66) | 0.62 (0.25-1.28) | |
| Smoking status | | | | 0.783 |
| Non-smoker | 1.00 (Ref.) | 0.58 (0.33-0.95) | 0.57 (0.32-0.94) | |
| Smoker | 1.00 (Ref.) | 0.93 (0.41-1.86) | 0.23 (0.01-1.09) | |
| Drinking status | | | | 0.421 |
| Non-drinker | 1.00 (Ref.) | 0.45 (0.23-0.77) | 0.58 (0.32-0.95) | |
| Drinker | 1.00 (Ref.) | 1.26 (0.64-2.30) | 0.19 (0.01-0.89) | |
| High-fat diet | | | | 0.569 |
| No | 1.00 (Ref.) | 0.61 (0.36-0.95) | 0.49 (0.26-0.84) | |
| Yes | 1.00 (Ref.) | 0.88 (0.30-2.04) | 0.57 (0.14-1.60) | |
| High-salt diet | | | | 0.660 |
| No | 1.00 (Ref.) | 0.63 (0.37-0.99) | 0.56 (0.31-0.92) | |
| Yes | 1.00 (Ref.) | 0.80 (0.30-1.74) | 0.23 (0.01-1.08) | |
| Vegetable and fruit intake | | | | 0.953 |
| Non-abundant | 1.00 (Ref.) | 0.55 (0.28-0.98) | 0.59 (0.29-1.09) | |
| Abundant | 1.00 (Ref.) | 0.77 (0.41-1.32) | 0.40 (0.15-0.84) | |

Full-adjusted model for age, gender, marital status, average monthly income, education level, smoking status, drinking status, physical activity, vegetable and fruit intake, high-fat diet, high-salt diet, BMI, energy intake, basal metabolic rate, family history of T2DM, weekly frequency of eating-out dinner

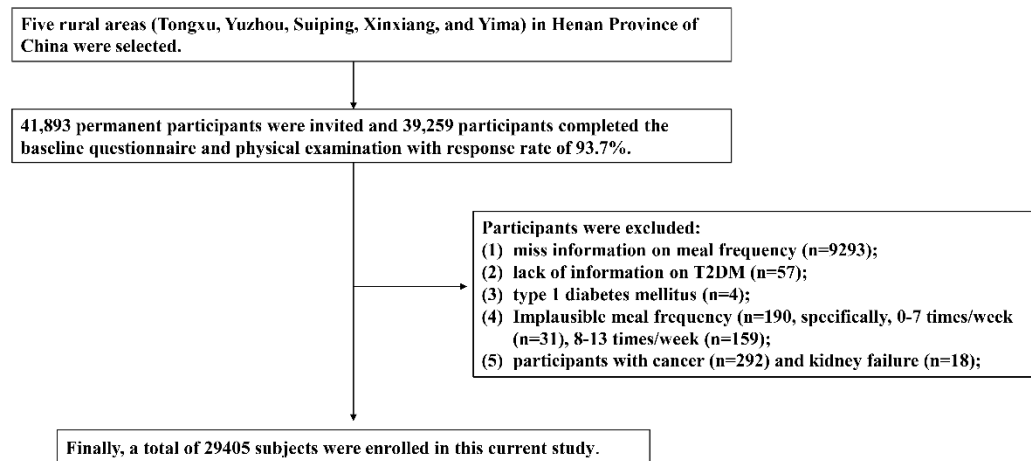


Figure S1. The flow chart for selecting study population