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1	Internet crawled on 10-Oct-2020 <a href="http://worldwidescience.org">worldwidescience.org</a>	115 words	5%
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8	Crossref Yaqun Teng, Jiuyang Xu, Yang Zhang, Zhenyu Liu, Shuya ng Zhang. "Mendelian randomization in COVID-19: Appi...	37 words	2%

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Name of Journal: *World Journal of Diabetes*

Manuscript NO: 58551

Manuscript Type: ORIGINAL ARTICLE

### Basic Study

Causal effect of education on type 2 diabetes: A network Mendelian randomization study

Liao LZ *et al.* Network MR for education and type 2 diabetes

Li-Zhen Liao, Zhi-Chong Chen, Wei-Dong Li, Xiao-Dong Zhuang, Xin-Xue Liao

### Abstract

#### BACKGROUND

The causality between education and type 2 diabetes (T2DM) remains unclear.

#### AIM

Exploring the causal pathway from education to type 2 diabetes: A



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## Network Mendelian randomization: using genetic variants as ...

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4469795>

Methods. We consider **the causal** effect of an exposure X on an outcome Y with a mediator Z. The exposure and mediator each have corresponding genetic IVs, G X and G Z respectively. A **causal** DAG illustrating the relationships between these variables is given in Figure 2. We consider the situation where the exposure, mediator and outcome are all continuous and assume that the ...

**Cited by:** 97

**Author:** Stephen Burgess, Rhian M Daniel, Ada...

**Publish Year:** 2015

## Exploring the causal pathway from body mass index to ...

<https://journals.sagepub.com/doi/full/10.1177/2040622320909040>

**Causal** associations of adiposity and body fat distribution with coronary heart disease, stroke subtypes, and **type 2 diabetes** mellitus: a **mendelian randomization** analysis. *Circulation* 2017 ; 135: 2373 – 2388 .

**Author:** Xun Hu, Xiao-Dong Zhuang, Wei-Yi ...

**Publish Year:** 2020

## Prioritising Risk Factors for Type 2 Diabetes: Causal ...

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5960479>

May 19, 2018 · The Urgency to Prioritise Proposed Risk Factors. For very few of the many **type 2 diabetes** (T2D) risk factors [1–6, 7•] that have emerged from observational research has **causal** relevance been demonstrated [8–12]. Randomised controlled trials are the “gold-standard” for causality assessment but are expensive and time-consuming, and may not be feasible (e.g. birth ...

**Cited by:** 4

**Author:** Laura B. L. Wittemans, Luca A. Lotta, Cl...

**Publish Year:** 2018

## A Mendelian Randomization Study of Circulating ... - Diabetes

<https://diabetes.diabetesjournals.org/content/64/8/3028> ▾

Aug 01, 2015 · We aimed to investigate **the causal** effect of circulating uric acid concentrations on **type 2 diabetes** risk. A **Mendelian randomization study** was performed using a genetic score with

41,500 Results Any time ▾

### Exploring the causal pathway from body mass index to ...

<https://journals.sagepub.com/doi/full/10.1177/2040622320909040>

Causal associations of adiposity and body fat distribution with coronary heart disease, stroke subtypes, and type 2 diabetes mellitus: a mendelian randomization analysis. *Circulation* 2017 ; 135: 2373 – 2388 .

Author: Xun Hu, Xiao-Dong Zhuang, Wei-Yi Mei, ... Publish Year: 2020

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### Exploring the Causal Pathway From Telomere Length to ...

<https://www.ncbi.nlm.nih.gov/pubmed/28515044>

Jul 21, 2017 · OBJECTIVE: To examine whether metabolic risk factors for CHD mediate the causal pathway from short TL to increased risk of CHD using a network Mendelian randomization design. METHODS AND RESULTS: Summary statistics from several genome-wide association studies were used in a 2-sample Mendelian randomization study design.

Cited by: 55 Author: Yiqiang Zhan, Ida K Karlsson, Robert Karlss...

Publish Year: 2017

### Exploring the Causal Pathway From Telomere Length to ...

<https://www.ahajournals.org/doi/full/10.1161/CIRCRESAHA.116.310517>

Network Mendelian randomization analysis—an approach using genetic variants as the instrumental variables for both the exposure and mediator to infer causality—was performed to examine the causal association between telomeres and CHD and metabolic risk factors.

Author: Yiqiang Zhan, Ida K. Karlsson, Robert K... Publish Year: 2017

### Exploring the causal pathway from ischemic stroke to ...

<https://molmed.biomedcentral.com/articles/10.1186/s10020-019-0133-y>

Jan 15, 2020 · Under the framework of network Mendelian randomization, two-sample Mendelian randomization study was performed using summary statistics from several genome-wide association studies. Inverse-variance weighted method was performed to estimate causal effect. Blood pressure mediates the causal pathways from ischemic stroke to atrial fibrillation.

Cited by: 2 Author: Lei Hou, Mingqing Xu, Yuanyuan Yu, Xiaoru...

Publish Year: 2020

### Exploring the causal pathway from omega-6 levels to ...

<https://www.sciencedirect.com/science/article/pii/S0939475319303527>

Feb 10, 2020 · Exploring the causal pathway from omega-6 levels to coronary heart disease: A network Mendelian randomization study ... diabetes, non-alcoholic fatty liver disease, and cardiovascular disease ... R.G. Morgan Network Mendelian randomization study design to assess factors mediating the causal link between telomere length and heart disease.

Cited by: 1 Author: Li-zhen Liao, Wei-dong Li, Ying Liu, Jia-ping...

Publish Year: 2020

### Exploring the causal pathway from body mass index to ...

<https://journals.sagepub.com/doi/pdf/10.1177/2040622320909040>

Exploring the causal pathway from body mass index to coronary heart disease: a network Mendelian randomization study Xun Hu, Xiao-Dong Zhuang, Wei-Yi Mei, Gang Liu, Zhi-Min Du, Xin-Xue Liao and Yi Li ... traits and higher risks for both type 2 diabetes Table 6. Causal ...

### Mendelian Randomization and Type 2 Diabetes

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4789194>

An early analysis of this type used a single variant at the FTO locus with a strong and well-characterised association with higher BMI, each allele accounting for approximately 0.29 kg/m<sup>2</sup> higher BMI in a large GWA study (p = 4.40 × 10<sup>-7</sup>; n = 127,553) and 0.36 kg/m<sup>2</sup> in the MR study (p = ...

### Systolic Blood Pressure and Risk of Type 2 Diabetes: A ...

<https://diabetes.diabetesjournals.org/content/66/2/543>

We applied the Mendelian randomization framework to evaluate the causal hypothesis that elevated SBP increases risk for type 2 diabetes. We used 28 genetic variants associated with SBP and evaluated their impact on type 2 diabetes using a European-centric meta-analysis comprising 37,293 case and 125,686 control subjects.

### Diabetes and cancer risk: A Mendelian randomization study ...

<https://onlinelibrary.wiley.com/doi/full/10.1002/ijc.32310>

Mar 30, 2019 · Introduction. Over the decades, a number of cohort studies reported associations between type 2 diabetes and increased cancer risks, especially liver, colorectal and pancreatic cancers. 1, 2 More recently, studies have shown that high levels of blood glucose 3, 4 or glycated hemoglobin A1c 5 are associated with cancer incidence. These associations are biologically plausible, given that ...

### Exploring the Causal Pathway From Telomere Length to ...

<https://www.researchgate.net/publication/317015498...>

PDF | Rationale: Observational studies have found shorter leukocyte telomere length (TL) to be a risk factor for coronary heart disease (CHD), and... | Find, read and cite all the research you ...

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### Causal association of type 2 diabetes with amyotrophic ...

<https://bmcmmedicine.biomedcentral.com/articles/10.1186/s12916-019-1448-9> ▾

Dec 04, 2019 · Associations between **type 2 diabetes** (T2D) and amyotrophic lateral sclerosis (ALS) were discovered in observational studies in both European and East Asian populations. However, whether such associations are **causal** remains largely unknown. We employed a two-sample **Mendelian randomization** approach to evaluate the **causal** relationship of T2D with the risk of ALS in both European and East ...

Cited by: 7

Author: Ping Zeng, Ting Wang, Junnian Zheng, Xian...

Publish Year: 2019

### Glucose and Insulin-Related Traits, Type 2 Diabetes and ...

<https://pubmed.ncbi.nlm.nih.gov/30100396>

Background: The link between schizophrenia and **diabetes** mellitus is well established by observational studies; however, the **cause-effect** relationship remains unclear. Methods: Here, we conducted **Mendelian randomization** analyses to assess a **causal** relationship of the genetic variants related to elevated fasting glucose levels, hemoglobin A 1c (HbA 1c), fasting insulin levels, and **type 2** ...

Cited by: 10

Author: Zhiqiang Li, Peng Chen, Peng Chen, Jianhu...

Publish Year: 2018

### ACE and Type 2 Diabetes Risk: A Mendelian Randomization Study

<https://care.diabetesjournals.org/content/43/4/835> ▾

Apr 01, 2020 · Introduction. **Diabetes** is a leading **cause** of death worldwide and an important risk factor for cardiovascular and kidney diseases ().The global prevalence of **diabetes** has doubled over the past 25 years (), and, thus, policies to slow its incidence are urgently required.Exercise, dieting, and some glucose-lowering drugs can prevent or delay the onset of **type 2 diabetes** ().

Cited by: 4

Author: Marie Pigeyre, Marie Pigeyre, Jennifer Sjaa...

Publish Year: 2020

### An atlas on risk factors for type 2 diabetes: a wide ...

<https://link.springer.com/article/10.1007/s00125-020-05253-x> ▾

Sep 08, 2020 · In addition, consistent with the **protective effects** of **high educational attainment** on **type 2 diabetes** in observational studies, the present study confirmed that genetically predicted **higher education** led to a lower **diabetes risk**. After adjustment for **BMI**, the **association**

## Mendelian Randomization

In epidemiology, Mendelian randomization is a method of using genetic variation in genes of known function to examine the causal effect of a modifiable exposure on disease in observational studies. The term was first proposed in 1986 and subsequently described by Gray et al. (1986) as a method for obtaining unbiased estimates of the effect of a causal variable without conducting a traditional randomised controlled trial. The authors also coined the term Mendelian randomization. This method provides a powerful control for reverse causation and confounding, which can otherwise impede or mislead epidemiological studies.

 Wikipedia

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