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## The relationship between health risk and consumption of confectioneries : An instrumental variable approach (Article) [\(Open Access\)](#)

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### Abstract

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Consumption of confectioneries is a determinant of health risk. However, how health risk determines the intake of confectioneries remains unclear. The objective is to examine how waist circumference (WC) as a measurement of health risk influences the consumption of confectioneries among adults. The research question is that do high-risk people consume more confectioneries than low-risk people? Methods: A quantitative research design with a focus on establishing a correlation between the measurement of health risk and consumption of confectioneries was adopted. Secondary analysis of a nationally representative cross-sectional data was used. The population of interest was the Malaysian population, regardless of being obese or non-obese. Analyses stratified by body mass index (BMI) or WC were not conducted. An instrumental variable (IV) approach was used to estimate the regression of consumption of confectioneries. BMI was used as an IV for WC. In the first stage, we regressed WC on all exogenous variables, including BMI. Then, we replaced the original values of WC with the fitted values of WC. Results: BMI was an appropriate IV for WC. An additional cm of WC was associated with a 0.022 unit of reduction in the serving of confectioneries per week. The negative relationship between WC and consumption of confectioneries indicated that adults who had high health risk consumed lesser confectioneries than adults who had low health risk. Conclusion: Drawing from the IV regression results, the present study highlighted that people with high health risk, rather than people with low health risk, were less likely to consume confectioneries. © 2020. Malaysian Journal of Nutrition. All rights reserved.

### SciVal Topic Prominence

Topic: Sugar-Sweetened Beverage | Added Sugars | Fructose

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[Body mass index](#) [confectionery](#) [health risk](#) [obesity](#) [waist circumference](#)

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## References (40)

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- 1 Zainuddin, A.A., Nor, N.M., Yusof, S.M., Ibrahim, A.I.N., Aris, T., Huat, F.L.  
Under-reporting of energy and nutrient intake is a persistent issue in the Malaysian Adult Nutrition Surveys ([Open Access](#))  
(2019) *Malaysian Journal of Nutrition*, 25 (2), pp. 261-271.  
<http://nutriweb.org.my/mjn/index.php>  
doi: 10.31246/nutriweb-2018-0022  
[View at Publisher](#)
- 2 Bleich, S.N., Wang, Y.C.  
Consumption of sugar-sweetened beverages among adults with type 2 diabetes ([Open Access](#))  
(2011) *Diabetes Care*, 34 (3), pp. 551-555. Cited 27 times.  
<http://care.diabetesjournals.org/>  
doi: 10.2337/dc10-1687  
[View at Publisher](#)
- 3 Bozeman, S.R., Hoaglin, D.C., Burton, T.M., Pashos, C.L., Ben-Joseph, R.H., Hollenbeck, C.S.  
Predicting waist circumference from body mass index ([Open Access](#))  
(2012) *BMC Medical Research Methodology*, 12, art. no. 115. Cited 22 times.  
doi: 10.1186/1471-2288-12-115  
[View at Publisher](#)
- 4 Burkhauser, R.V., Cawley, J.  
Beyond BMI: The value of more accurate measures of fatness and obesity in social science research ([Open Access](#))  
(2008) *Journal of Health Economics*, 27 (2), pp. 519-529. Cited 414 times.  
doi: 10.1016/j.jhealeco.2007.05.005  
[View at Publisher](#)
- 5 Cawley, J., Meyerhoefer, C.  
The medical care costs of obesity: An instrumental variables approach  
(2012) *Journal of Health Economics*, 31 (1), pp. 219-230. Cited 804 times.  
doi: 10.1016/j.jhealeco.2011.10.003  
[View at Publisher](#)
- 6 Cheah, Y.K., Abdul Adzis, A., Abu Bakar, J., Applanaidu, S.D.  
Factors associated with consumption of sugar-sweetened foods and beverages in Malaysia: an ethnic comparison  
(2019) *International Journal of Diabetes in Developing Countries*, 39 (3), pp. 568-578. Cited 4 times.  
<http://www.springerlink.com.ezlib.iium.edu.my/content/0973-3930/>  
doi: 10.1007/s13410-018-0673-7  
[View at Publisher](#)

- 7 Cheah, Y.-K., Adzis, A.A., Bakar, J.A., Applanaidu, S.D.  
Factors associated with demand for tobacco across malaysian regions: Participation and level of consumption  
(2019) *International Journal of Business and Society*, 20 (3), pp. 1160-1177.  
<http://www.ijbs.unimas.my/images/repository/pdf/Vol20-no3-paper19.pdf>
- 
- 8 Cheah, Y.K., Abdul Adzis, A., Abu Bakar, J., Applanaidu, S.D.  
Sociodemographic determinants of Malaysian household's use of and expenditure on alcohol: a regional comparison  
(2020) *Drugs: Education, Prevention and Policy*, 27 (2), pp. 165-172. Cited 2 times.  
<http://www.tandfonline.com.ezlib.iium.edu.my/loi/idep20>  
doi: 10.1080/09687637.2019.1587387
- [View at Publisher](#)
- 
- 9 Chinedu, SN, Ogunlana, OO, Azuh, DE, Iweala, EEJ, Afolabi, IS, Uhuegbu, CC, Idachaba, ME, (...), Osamor, VC  
Correlation between body mass index and waist circumference in Nigerian adults: Implication as indicators of health status  
(2013) *J Public Health Res*, 2, pp. 93-98. Cited 13 times.
- 
- 10 Friis, K., Lyng, J.I., Lasgaard, M., Larsen, F.B.  
Energy drink consumption and the relation to socio-demographic factors and health behaviour among young adults in Denmark. A population-based study ([Open Access](#))  
(2014) *European Journal of Public Health*, 24 (5), pp. 840-844. Cited 23 times.  
<http://eurpub.oxfordjournals.org/>  
doi: 10.1093/eurpub/cku003
- [View at Publisher](#)
- 
- 11 Gierach, M, Gierach, J, Ewertowska, M, Arndt, A, Junik, R  
Correlation between body mass index and waist circumference in patients with metabolic syndrome  
(2014) *ISRN Endocrinol*, 2014, p. 514589. Cited 45 times.
- 
- 12 Hu, F.B.  
Resolved: There is sufficient scientific evidence that decreasing sugar-sweetened beverage consumption will reduce the prevalence of obesity and obesity-related diseases ([Open Access](#))  
(2013) *Obesity Reviews*, 14 (8), pp. 606-619. Cited 497 times.  
doi: 10.1111/obr.12040
- [View at Publisher](#)
- 
- 13 (2014) *National Health and Morbidity Survey 2014: Malaysian Adult Nutrition Survey (MANS)*. Cited 10 times.  
IPH Institute for Public Health, Ministry of Health Malaysia, Putrajaya
- 
- 14 (2015) *National Health and Morbidity Survey 2015: Non-communicable Diseases, Risk Factors and Other Health Problems*. Cited 278 times.  
IPH Institute for Public Health, Ministry of Health Malaysia, Putrajaya
- 
- 15 (2008) *The Third National Health and Morbidity Survey 2006*. Cited 313 times.  
IPH Institute for Public Health, Ministry of Health Malaysia, Putrajaya

16 Janssen, I., Katzmarzyk, P.T., Ross, R.

Waist circumference and not body mass index explains obesity-related health risk  
[\(Open Access\)](#)

(2004) *American Journal of Clinical Nutrition*, 79 (3), pp. 379-384. Cited 1199 times.  
<http://www.ajcn.org/contents-by-date.2005.shtml>  
doi: 10.1093/ajcn/79.3.379

[View at Publisher](#)

---

17 Kenkel, D.S., Schmeiser, M.D., Urban, C.

Is smoking inferior? Evidence from variation in the earned income tax credit

(2014) *Journal of Human Resources*, 49 (4), pp. 1094-1120. Cited 27 times.  
<http://jhr.uwpress.org/content/49/4/1094.full.pdf>  
doi: 10.3388/jhr.49.4.1094

[View at Publisher](#)

---

18 Kinge, J.M.

Waist circumference, body mass index, and employment outcomes [\(Open Access\)](#)

(2017) *European Journal of Health Economics*, 18 (6), pp. 787-799. Cited 5 times.  
[link.springer.de/link/service/journals/10198/index.htm](http://link.springer.de/link/service/journals/10198/index.htm)  
doi: 10.1007/s10198-016-0833-y

[View at Publisher](#)

---

19 Kleiman, S., Ng, S.W., Popkin, B.

Drinking to our health: Can beverage companies cut calories while maintaining profits? [\(Open Access\)](#)

(2012) *Obesity Reviews*, 13 (3), pp. 258-274. Cited 80 times.  
doi: 10.1111/j.1467-789X.2011.00949.x

[View at Publisher](#)

---

20 Komlos, J., Smith, P.K., Bogin, B.

Obesity and the rate of time preference: Is there a connection? [\(Open Access\)](#)

(2004) *Journal of Biosocial Science*, 36 (2), pp. 209-219. Cited 150 times.  
doi: 10.1017/S0021932003006205

[View at Publisher](#)

---

21 Kragelund, C., Omland, T.

A farewell to body-mass index?

(2005) *Lancet*, 366 (9497), pp. 1589-1591. Cited 79 times.  
<http://www.journals.elsevier.com/the-lancet/>  
doi: 10.1016/S0140-6736(05)67642-8

[View at Publisher](#)

---

22 Lin, S., Tukana, I., Linhart, C., Morrell, S., Taylor, R., Vatucawaqa, P., Magliano, D.J., (...), Zimmet, P.

Diabetes and obesity trends in Fiji over 30 years [\(Open Access\)](#)

(2016) *Journal of Diabetes*, 8 (4), pp. 533-543. Cited 30 times.  
[http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/\(ISSN\)1753-0407](http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/(ISSN)1753-0407)  
doi: 10.1111/1753-0407.12326

[View at Publisher](#)

---

23 Lum, M

(2018) *The plague of NCDs afflicting Malaysia*

From [Retrieved February 12, 2020]

<https://www.thestar.com.my/lifestyle/health/2018/10/10/non-communicable-diseases-malaysia>

24 Mehta, P.D.

### Control Variables in Research

(2015) *International Encyclopedia of the Social & Behavioral Sciences: Second Edition*, pp. 840-843. Cited 3 times.

<http://www.sciencedirect.com.ezlib.iium.edu.my/science/book/9780080970875>

ISBN: 978-008097087-5; 978-008097086-8

doi: 10.1016/B978-0-08-097086-8.44013-4

[View at Publisher](#)

---

25 Moore, L.L., Bradlee, M.L., Singer, M.R., Splansky, G.L., Proctor, M.H., Ellison, R.C., Kreger, B.E.

BMI and waist circumference as predictors of lifetime colon cancer risk in Framingham Study adults ([Open Access](#))

(2004) *International Journal of Obesity*, 28 (4), pp. 559-567. Cited 231 times.

doi: 10.1038/sj.ijo.0802606

[View at Publisher](#)

---

26 Naughton, P., McCarthy, M., McCarthy, S.

Reducing consumption of confectionery foods: A post-hoc segmentation analysis using a social cognition approach ([Open Access](#))

(2017) *Appetite*, 117, pp. 168-178. Cited 5 times.

<http://www.elsevier.com.ezlib.iium.edu.my/inca/publications/store/6/2/2/7/8/5/index.htm>

doi: 10.1016/j.appet.2017.06.027

[View at Publisher](#)

---

27 O'Neill, D.

Measuring obesity in the absence of a gold standard ([Open Access](#))

(2015) *Economics and Human Biology*, 17, pp. 116-128. Cited 20 times.

[http://www.elsevier.com.ezlib.iium.edu.my/wps/find/journaldescription.cws\\_home/622964/description#description](http://www.elsevier.com.ezlib.iium.edu.my/wps/find/journaldescription.cws_home/622964/description#description)

doi: 10.1016/j.ehb.2015.02.002

[View at Publisher](#)

---

28 Park, S., Thompson, F.E., McGuire, L.C., Pan, L., Galuska, D.A., Blanck, H.M.

Sociodemographic and Behavioral Factors Associated with Added Sugars Intake among US Adults ([Open Access](#))

(2016) *Journal of the Academy of Nutrition and Dietetics*, 116 (10), pp. 1589-1598. Cited 15 times.

[http://www.elsevier.com.ezlib.iium.edu.my/wps/find/journaldescription.cws\\_home/727057/description#description](http://www.elsevier.com.ezlib.iium.edu.my/wps/find/journaldescription.cws_home/727057/description#description)

doi: 10.1016/j.jand.2016.04.012

[View at Publisher](#)

---

29 Pollard, C.M., Meng, X., Hendrie, G.A., Hendrie, D., Sullivan, D., Pratt, I.S., Kerr, D.A., (...), Scott, J.A.

Obesity, socio-demographic and attitudinal factors associated with sugar-sweetened beverage consumption: Australian evidence ([Open Access](#))

(2016) *Australian and New Zealand Journal of Public Health*, 40 (1), pp. 71-77. Cited 16 times.

[http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/\(ISSN\)1753-6405/issues](http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/(ISSN)1753-6405/issues)

doi: 10.1111/1753-6405.12482

[View at Publisher](#)

---

30 Rehm, C.D., Matte, T.D., Van Wye, G., Young, C., Frieden, T.R.

Demographic and behavioral factors associated with daily sugar-sweetened soda consumption in New York City adults ([Open Access](#))

(2008) *Journal of Urban Health*, 85 (3), pp. 375-385. Cited 65 times.

doi: 10.1007/s11524-008-9269-8

[View at Publisher](#)

31 Smith, P.K., Bogin, B., Bishai, D.

Are time preference and body mass index associated? Evidence from the National Longitudinal Survey of Youth

(2005) *Economics and Human Biology*, 3 (2 SPEC. ISS.), pp. 259-270. Cited 101 times.  
doi: 10.1016/j.ehb.2005.05.001

[View at Publisher](#)

---

32 Stern, D., Middaugh, N., Rice, M.S., Laden, F., López-Ridaura, R., Rosner, B., Willett, W., (...), Lajous, M. Changes in sugar-sweetened soda consumption, weight, and waist circumference: 2-year cohort of Mexican women ([Open Access](#))

(2017) *American Journal of Public Health*, 107 (11), pp. 1801-1808. Cited 11 times.  
<http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.2017.304008>  
doi: 10.2105/AJPH.2017.304008

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---

33 Mohamud, W.N.W., Musa, K.I., Khir, A.S.M., Ismail, A.A.-S., Ismail, I.S., Kadir, K.A., Kamaruddin, N.A., (...), Bebakar, W.M.W.

Prevalence of overweight and obesity among adult malaysians: An update

(2011) *Asia Pacific Journal of Clinical Nutrition*, 20 (1), pp. 35-41. Cited 67 times.  
[http://apjcn.nhri.org.tw/server/APJCN/Volume20/vol20.1/Finished/6\\_1806\\_35-41.pdf](http://apjcn.nhri.org.tw/server/APJCN/Volume20/vol20.1/Finished/6_1806_35-41.pdf)

---

34 Wooldridge, J

(2013) *Introductory econometrics: A modern approach*. Cited 6779 times.  
5th ed. South-Western Cengage Learning, Ohio

35 (2018) *Fact sheet: Noncommunicable diseases*. Cited 19 times.

WHO World Health Organization. From [Retrieved February 12, 2020]  
<https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>

---

36 Xu, F., Park, S., Siegel, K.R.

Factors Associated With Frequency of Sugar-Sweetened Beverage Consumption Among US Adults With Diabetes or Prediabetes

(2018) *American Journal of Health Promotion*, 32 (7), pp. 1489-1497. Cited 6 times.  
<http://ahp.sagepub.com/content/by/year>  
doi: 10.1177/0890117117746187

[View at Publisher](#)

---

37 Yusuf, S., Hawken, S., Ôunpuu, S., Bautista, L., Franzosi, M.G., Commerford, P., Lang, C.C., (...), Anand, S.S.

Obesity and the risk of myocardial infarction in 27 000 participants from 52 countries: A case-control study

(2005) *Lancet*, 366 (9497), pp. 1640-1649. Cited 2002 times.  
doi: 10.1016/S0140-6736(05)67663-5

[View at Publisher](#)

---

38 Zhu, Q., Shen, F., Ye, T., Zhou, Q., Deng, H., Gu, X.

Waist-to-height ratio is an appropriate index for identifying cardiometabolic risk in Chinese individuals with normal body mass index and waist circumference

(2014) *Journal of Diabetes*, 6 (6), pp. 527-534. Cited 21 times.  
<http://www.interscience.wiley.com.ezlib.iium.edu.my/jpages/1753-0393>  
doi: 10.1111/1753-0407.12157

[View at Publisher](#)

39 Zhu, S., Wang, Z., Heshka, S., Heo, M., Faith, M.S., Heymsfield, S.B.

Waist circumference and obesity-associated risk factors among whites in the third National Health and Nutrition Examination Survey: Clinical action thresholds  
(Open Access)

(2002) *American Journal of Clinical Nutrition*, 76 (4), pp. 743-749. Cited 470 times.  
<http://www.ajcn.org/contents-by-date.2005.shtml>  
doi: 10.1093/ajcn/76.4.743

[View at Publisher](#)

---

40 Zytnick, D., Park, S., Onufrak, S.J., Kingsley, B.S., Sherry, B.

Knowledge of sugar content of sports drinks is not associated with sports drink consumption

(2015) *American Journal of Health Promotion*, 30 (2), pp. 101-108. Cited 7 times.  
<http://www.ajhpcontents.com/doi/pdf/10.4278/ajhp.130916-QUAN-479>  
doi: 10.4278/ajhp.130916-QUAN-479

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