

The Habit of Consuming Fast Food and Soft Drinks Has Been Proven to Cause Diabetes Mellitus in Banyuanyar Village, Banyuwangi

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Abstract

The non-communicable disease with the largest death toll globally is diabetes mellitus (DM). This disease can affect anyone, especially people with risk factors such as obesity, infectious diseases, hereditary factors, or an unhealthy diet. An unhealthy diet can result in increased sugar levels, which leads to serious symptoms such as dehydration, dizziness when standing, shortness of breath, and unconsciousness. This study aims to analyze the relationship between the habit of consuming fast food and soft drinks with the incidence of diabetes mellitus in Banyuanyar village, Banyuwangi. This type of research is of a quantitative type accompanied by a cross sectional design. The population of this study is people with Diabetes Mellitus in Banyuanyar Village, Banyuwangi. There were 30 respondents with sample collection using the total sampling methodology. Questionnaires and sugar levels check include research instruments. The results of the Spearman's rho test obtained a significant value of $p\text{-value } 0.016 > 0.05$, meaning that there was a correlation between the habit of consuming fast food and soft drinks and the incidence of diabetes mellitus in Banyuanyar village, Banyuwangi. The importance of increasing knowledge in consuming fast food and soft drinks. The conclusion of this study is that there is a significant relationship between the habit of consuming fast food and soft drinks for people with Diabetes Mellitus.

Keywords: Diabetes Mellitus, Consumption Habits, Fast Food, Soft Drinks

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Abstrak

Penyakit tidak menular disertai angka kematian terbesar secara global ialah diabetes melitus (DM). Penyakit ini dapat terjangkit pada siapa saja, terutama pada orang dengan faktor resiko seperti kegemukan, penyakit infeksi, faktor keturunan, atau tak sehatnya pola makan. Pola makan tak sehat bisa mengakibatkan kadar gula meningkat, yang menyebabkan gejala serius seperti dehidrasi pusing saat berdiri, sesak nafas, dan tidak sadarkan diri. Penelitian ini bertujuan menganalisis hubungan kebiasaan mengkonsumsi *fast food* dan *soft drink* dengan kejadian diabetes melitus di desa Banyuanyar Banyuwangi. Jenis Penelitian ini berjenis kuantitatif disertai rancangan *cross sectional*. Populasi penelitian ini yaitu penderita Diabetes Melitus di Desa Banyuanyar Banyuwangi. Terdapat 30 responden dengan pengambilan sampel memakai metodologi *total sampling*. Kuesioner dan pengecekan kadar gula termasuk instrumen penelitian. Hasil uji *Spearman's rho* didapatkan nilai yang signifikan yaitu $p\text{-value } 0.016 > 0.05$ artinya ada korelasi antara kebiasaan mengkonsumsi *fast food* dan *soft drink* dengan kejadian diabetes melitus di desa Banyuanyar Banyuwangi. Pentingnya meningkatkan pengetahuan dalam mengkonsumsi *fast food* beserta *soft drink*. Kesimpulan dari penelitian ini terdapat hubungan signifikan kebiasaan mengkonsumsi *fast food* dan *soft Drink* terhadap penderita Diabetes Melitus.

Keywords: Diabetes Melitus, Kebiasaan mengkonsumsi *Fast Food*, *Soft Drink*



Introduction

The highest death rate throughout the world occurs in non-communicable diseases, one of which is Diabetes Mellitus (DM) (Sun *et al.*, 2023). Anyone can get diabetes mellitus, especially if they have risk factors

such as obesity, infectious disease, hereditary factors, or due to unhealthy diet (Tarigan, 2022). Unhealthy eating patterns, for example, consuming sweet and fatty foods in DM sufferers, can cause sugar levels to increase (A. Anggraini, 2022). Increased sugar levels can cause severe symptoms, such as dehydration,

dizziness when standing, shortness of breath, and even unconsciousness (Wahyuni *et al.*, 2019).

Data from the International Diabetes Federation (IDF) states that 536.6 million people are living with diabetes (diagnosed or undiagnosed) in 2021, an increase of 46% to reach 783.2 million in 2045 (Ogurtsova *et al.*, 2022). According to data from the Ministry of Health of the Republic of Indonesia, 19.47 million people suffer from diabetes mellitus in 2021 (Kemenkes RI, 2022). The prevalence of DM sufferers in 2022 in East Java is 863,686 residents aged 15 and over (Dinas Kesehatan Prov Jatim, 2022). The Banyuwangi Health Profile 2022 states that the prevalence rate of DM sufferers is 26,329 cases, while the prevalence rate in the Kalibaru Kulon Health Center working area is 1,664 people (Dinas Kesehatan Kab. Banyuwangi, 2022). Data from the Kalibaru Kulon Banyuwangi Community Health Center in 2022 who experienced diabetes mellitus showed a figure of 291 people.

Diabetes Mellitus has two risk factors, namely unchangeable (age, gender, genetic history) and changeable (excess body weight, lack of physical activity, and unhealthy diet) (Sutomo & Purwanto, 2023). Food consumption and daily lifestyle are the leading causes of increasing fat mass and changing body composition. If a person consumes more energy than needed, this dramatically affects glucose metabolism, especially oxidation, sugar storage, and insulin secretion (Indira Prameswari & Zuraida, 2023). Insulin secretion is caused by fatty and sweet foods (Sherani *et al.*, 2023). Fast food and soft drinks are examples of fatty foods high in calories, saturated fat, and sugar but low in fiber (Yuliani & Nugroho, 2022).

Management of risk factors as an effective prevention of DM, namely by implementing compliance with the four pillars: education, diet, physical activity, and pharmacology (Azrin & Suyanto, 2020). The incidence of DM is often related to the sufferer's lifestyle, one of which is a person's eating habits; one of the efforts to prevent complications is adopting a healthy and balanced lifestyle (Widia & Kurniasih, 2024). Nurses' efforts are also essential in educating families and sufferers regarding DM treatment programs (Rahmawati *et al.*, 2024). One is maintaining blood sugar control through a diabetes diet and adhering to the right type, amount, and routine (Wardhani, 2021). The general purpose of this study is to find out the relationship between the habit of consuming fast food and soft drinks for people with

Diabetes Mellitus in Banyuwangi Village, Banyuwangi.

Methods

The research uses a quantitative descriptive methodology and a cross-sectional approach. The sample for this research was 30 DM sufferers in Banyuwangi village. Samples were taken using a total sampling methodology. Data was obtained through questionnaires and GDA check results, then tested using SPSS with the Spearman rho test to determine the relationship between variables. The hypothesis is accepted if the significant value is <0.05 and rejected if the value is >0.05 . This research was carried out after obtaining permission or approval from the ethics commission No: 292/03/KEPK-STIKESBWI/VII/2024.

The principles of research ethics are upheld to maintain the integrity of researchers and protect respondents from human rights violations. In this study, the researcher used the following aspects of research ethics: Informed consent, anonymity, confidentiality, benefit, non-maleficence, veracity, and justice.

Results

The research results consist of:

Consume Fast Food and Soft Drinks

Table 1. Consumption Frequency Distribution

Fast Food & Soft Drinks	Frequency	(%)
Rarely	3	10,0%
Frequently	13	43,3%
Very often	14	46,7%
Total	30	100%

Table 1 shows that of the 30 respondents, 14 (46.7%) consume fast food and soft drinks very often.

Average Random Blood Sugar Levels

Table 2. Distribution of Average Blood Sugar Levels

Mark	Amount	Percentage (%)
Low	0	0%
Normal	6	20,0%
Tall	24	80,0%
Total	30	100%

Based on measurements of blood sugar at the time of the research, table 2 indicates that out of 30 respondents, there were 24 respondents (80.0%).

The data findings in table 3 indicate that the number of respondents who rarely consume fast food

& soft drinks and whose blood sugar is average is one respondent (33.3%), while those whose blood sugar is high are two (66.7%). For respondents who consumed fast food & soft drinks frequently, five respondents (38.5%) had regular blood sugar, while eight respondents (61.5%) had regular blood sugar. For respondents who very often consume fast food and whose blood sugar is not regular, there are 14 respondents (100%), while 0 are average.

Table 3. Cross Tabulation Results

Fast Food & Soft Drinks	Random Average Value of Sugar Levels		Total
	Normal	High	
Seldom			
Often	1 (33,3%)	2 (66,7%)	3 (100,0%)
Very often	5 (38,5%)	8 (61,5%)	13 (100,0%)
Total	0 (0,0%)	14 (100,0%)	14 (100,0%)
Fast Food & Soft Drinks	6 20,0%	24 80,0%	30 100,0%

Table 4 Results of the Spearman Rho Test on the Relationship between Fast Food Consumption and Sugar Levels of DM Patients

Random Sugar Levels of DM Patients	C	Habits of Consuming Fast Food & Soft Drinks	Average Random Sugar Levels of DM Patients
		S	1,000
N	C	30	30
	S	,437	1,000
N	S	,016	
	N	30	30

Based on table 4 above, the results of the spearman rho test were obtained $p = .016 < 0.05$. So there is a significant correlation between the habit of consuming fast food & soft drinks and the incidence of diabetes mellitus.

Discussion

Consume Fast Food and Soft Drinks

Based on Table 1, DM sufferers consume fast food and soft drinks in Banyuanyar village with a persistent frequency of 14 respondents (64.7%). Many factors that influence someone to consume fast food and soft drinks come from internal factors, namely knowledge (Mulyani *et al.*, 2020), as well as external factors, such as environmental influences, one of which is taste,

eating habits outside the home, and the environment (N. V. Anggraini *et al.*, 2020). This is in line with research by Devi Ariani (2019), who argues that one of the causes of food behavior problems is minimal knowledge; the level of expertise determines the ease with which a person understands the impact of diet (Linggarsih, 2020). For each individual, different factors contribute to the high fast food intake. People choose fast food and soft drinks because they are more practical and suit consumer tastes (Laksono *et al.*, 2022).

Based on the information researchers obtained, some respondents needed higher education, impacting their knowledge about self-care management and how they received information from the media and others. They need to learn more about the dangers of consuming fast food and soft drinks excessively, which shows little knowledge. In this era of globalization, satisfying appetite is an easy thing, supported by external factors, such as routine jobs and living together, so they choose food according to taste. This is proven by respondents' statements that they consume fast food and soft drinks because they are practical and tasteful.

Incidence of Diabetes Mellitus

Based on Table 2, DM sufferers consume fast food and soft drinks in Banyuanyar village with a persistent frequency of 14 respondents (64.7%). Human behavior in the era of globalization has a significant impact on Diabetes Mellitus with the development of the times, human lifestyle will continue to change (Faida & Santik, 2020). Diabetes Mellitus is caused by several risk factors, age, gender, genetic factors and diet (Pangestika *et al.*, 2022). It is known that those aged ≥ 45 years have a greater risk of suffering from DM due to degenerative factors, including a decrease in the body's ability to process sugar (Khoir & Clara, 2020). In a study (Widiyoga *et al.*, 2020) most of the female sex said that women have a higher risk of developing DM than men because women's metabolism is slower than men. Someone who has offspring is more at risk of developing DM than those who do not have a hereditary factor for DM sufferers (Vadila *et al.*, 2021). Diet is an important factor in maintaining the balance of sugar levels in the body. Juli Widiyanto's research (2019) revealed that someone who is used to not having breakfast is at higher risk compared to those who have a habit of having breakfast (Al Mansour, 2020). This triggers insulin resistance which is caused by the activation of the Brd2 gene so that there is a

spike in sugar (Ritonga & Annum, 2019).

Based on the information that researchers obtained, some respondents needed higher education, impacting their knowledge about self-care management and how they received information from the media and others. They need to learn more about the dangers of consuming fast food and soft drinks excessively, which shows little knowledge. In this era of globalization, satisfying appetite is an easy thing, supported by external factors, such as routine jobs and living together, so they choose food according to taste. This is proven by respondents' statements that they consume fast food and soft drinks because they are practical and tasteful.

Relationship between the habit of consuming fast food and soft drinks and the incidence of diabetes mellitus

Based on the results of data analysis using the Spearman Rho test in Table 4.4, carried out on 30 respondents, the results were obtained with a ρ value of 0.016 because the ρ value was $0.016 < \alpha 0.05$, so the decision H_a was accepted, which means there is a relationship between the habit of consuming fast food and soft drinks and incidence of diabetes mellitus.

The habit of consuming fast food and soft drinks influences the risk of developing diabetes mellitus (Agung & Hansen, 2022). This is in line with research by Almarshad (2022), where consumption of fast food, sweet drinks, and salty processed foods was found to increase the risk of prediabetes by 248% and 48%, and the risk of T2D by 219% and 600% respectively, compared to individuals who do not consume fast food and soft drinks or have a rare consumption ratio (Almarshad *et al.*, 2022). Likewise, a British cross-sectional study also showed an association between increased intake of fast food and soft drinks, which contain lots of carbohydrates, free sugars, total fat, and saturated fat, which can lead to an increase in the incidence of DM (Rauber *et al.*, 2019). Where consumption of fast food and soft drinks can increase the risk of increasing sugar levels and impact increasing body weight; if body weight increases, fat accumulation occurs, which causes insulin resistance, which affects glucose levels in the body that are not controlled, resulting in diabetes mellitus (Gani *et al.*, 2023). Supported by research results by Wulandari (2019), diabetes mellitus can be inherited from parents to children. This genetic or hereditary factor can be caused by damage to the organ of the pancreas due to the body's immune system physically attacking and

destroying pancreatic cells (Kulsum *et al.*, 2022).

In this study, the majority of respondents consumed fast food and soft drinks two times a day or more, fast food and soft drinks, namely processed noodles and fried rice, which are generally high in saturated fat, sugar, and calories, and soft drinks that are frequently consumed are high in sugar without fiber or nutrients. Respondents consumed it regularly, disrupting sugar stability and resulting in type 2 DM. Most of the respondents in this study were siblings, so this may be supported by genetic factors contributing to the occurrence of DM.

Conclusion

This research produces a relationship between fast food and soft drink consumption habits and the incidence of diabetes mellitus in Banyuanyar Banyuwangi village. The habit of consuming fast food and soft drinks categories very often amounted and the average blood sugar level in DM sufferers was in the high category. The analysis results show a significant value meaning there is a correlation between the habit of consuming fast food and soft drinks and the incidence of diabetes mellitus in Banyuanyar village, Banyuwangi.

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Conflicts of Interest

No conflict of interest.

References

- Agung, S. Q. M., & Hansen. (2022). Studi Konsumsi Junk Food dan Soft Drink Sebagai Penyebab terjadinya Diabetes Melitus Tipe 2 pada Remaja. *Burneo Sudent Reserch*, 1(2), 1774–1782.
- Al Mansour, M. A. (2020). The Prevalence and Risk Factors of Type 2 Diabetes Mellitus (DMT2) in a Semi-Urban Saudi Population. *International Journal of Environmental Research and Public Health*, 17(1), 1–8. <https://doi.org/10.3390/ijerph17010007>
- Almarshad, M. I., Algonaiman, R., Alharbi, H. F., Almujaydil, M. S., & Barakat, H. (2022). Relationship between Ultra-Processed Food Consumption and. *Nutrients*, 14, 1–10.
- Anggraini, A. (2022). *Hubungan Antara Pola Makan dengan Kadar Gula Darah pada Penderita Diabetes Melitus Tipe*

- 2 : *Literature Review*. 3(3), 2472–2487.
- Anggraini, N. V., Balafif, M., & Rahmasari, A. (2020). Faktor-Faktor yang Mempengaruhi Pola Konsumsi Makanan Siap Saji di Kalangan Mahasiswa (Studi Kasus Fakultas Ekonomi dan Bisnis Universitas Bhayangkara Surabaya). *Universitas Bhayangkara Surabaya*, 1–10.
- Azrin, M., & Suyanto, S. (2020). Upaya pencegahan Diabetes Melitus melalui edukasi kesehatan pada masyarakat Kampung Pelita Medika Buluh Cina. *Unri Conference Series: Community Engagement*, 2, 298–302. <https://doi.org/10.31258/unricscce.2.298-302>
- Dinas Kesehatan Kab. Banyuwangi. (2022). *Profil Kesehatan Pemerintah Kabupaten Banyuwangi* (Issue 68).
- Dinas Kesehatan Prov Jatim. (2022). *Profil Kesehatan Provinsi Jawa Timur* (pp. 1–387).
- Faida, A. N., & Santik, Y. D. P. (2020). Kejadian Diabetes Melitus Tipe I pada Usia 10-30 Tahun. *Higeia Journal of Public Health Research and Development*, 4(1), 33–42.
- Gani, R. J. P. R., Rahmah, R., Aliyati, N. N., Tusi, J. S., & Sasmito, P. (2023). Konsumsi Gula Pasir dan Konsumsi Serat Terhadap Kejadian Diabetes Melitus. *Holistik Jurnal Kesehatan*, 17(3), 246–252. <https://doi.org/10.33024/hjk.v17i3.10289>
- Indira Prameswari, P. A., & Zuraida, R. (2023). Hubungan antara Asupan Makanan Terhadap Diabetes Mellitus Tipe 2: Sebuah Studi Pustaka. *Medical Profession Journal of Lampung*, 13(1), 35–41. <https://doi.org/10.53089/medula.v13i1.595>
- Kemendes RI. (2022). *Profil Kesehatan Indonesia 2022* (F. Sibuea (ed.)). KEMENKES RI.
- Khoir, D. R., & Clara, H. (2020). Asuhan Keperawatan Pada Pasien Dengan Diabetes Melitus Tipe 2. *Buletin Kesehatan: Publikasi Ilmiah Bidang Kesehatan*, 3(2), 133–147. <https://doi.org/10.36971/keperawatan.v3i2.49>
- Kulsum, I. N. S., Suryana, S., & Soni, D. (2022). Review: Molecularly Imprinted Polymer Solid Phase Extraction (MIP-SPE) untuk Pengujian Glibenklamid dalam Cairan Biologis. *Jurnal Sains Dan Kesehatan*, 4(2), 205–213. <https://doi.org/10.25026/jsk.v4i2.749>
- Laksono, R. A., Mukti, N. D., & Nurhamidah, D. (2022). Dampak Makanan Cepat Saji Terhadap Kesehatan pada Mahasiswa Program Studi “X” Perguruan Tinggi “Y.” *Jurnal Ilmiah Kesehatan Masyarakat: Media Komunikasi Komunitas Kesehatan Masyarakat*, 14(1), 35–39. <https://doi.org/10.52022/jikm.v14i1.282>
- Linggarsih, H. D. (2020). *Gambaran Pengetahuan, Sikap dan Pola Makan Remaja Pengguna Media Sosial Di SMAN kota Bengkulu Tahun 2020* (Vol. 21, Issue 1).
- Mulyani, P. A., Sudiartini, N. W., & Sariyani, N. L. P. (2020). Perilaku Masyarakat Kota Denpasar dalam Mengonsumsi Makanan Cepat Saji (Fast food). *JUMA: Jurnal Ilmu Manajemen*, 10(2), 91–103. <https://doi.org/https://doi.org/10.36733/juima.v10i2>
- Ogurtsova, K., Guariguata, L., Barengo, N. C., Ruiz, P. L. D., Sacre, J. W., Karuranga, S., Sun, H., Boyko, E. J., & Magliano, D. J. (2022). IDF Diabetes Atlas: Global Estimates of Undiagnosed Diabetes in Adults for 2021. *Diabetes Research and Clinical Practice*, 183. <https://doi.org/10.1016/j.diabres.2021.109118>
- Pangestika, H., DianitaEkawati, & Murni, N. S. (2022). Faktor-Faktor Yang Berhubungan Dengan Kejadian Diabetes Melitus Tipe 2. *JKM (Jurnal Kesehatan Masyarakat) Cendekia Utama*, 10(2), 199. <https://doi.org/10.31596/jkm.v10i2.1069>
- Rahmawati, A. A., Simamora, R. S., & Pelawi, A. M. P. (2024). Hubungan Tingkat Kepatuhan 4 Pilar Penatalaksana Diabetes dengan Kualitas Hidup Penderita DM di Puskesmas Danau Indah Tahun 2023. *Jurnal Bidang Ilmu Kesehatan*, 14(1), 49–59. <https://doi.org/10.52643/jbik.v14i1.3285>
- Rauber, F., Louzada, M. L. da C., Steele, E. M., Millett, C., Monteriro, C. A., & Levy, R. B. (2019). Ultra-Processed Food Consumption and Chronic Non-Communicable Diseases-Related Dietary Nutrient Profile in The UK (2008–2014). *Nutrients*, 10(5). <https://doi.org/10.3390/nu10050587>
- Ritonga, N., & Annum, R. (2019). Analisis Determinan Faktor Risiko Diabetes Melitus Tipe II Di Puskesmas Batunadua Tahun 2019. *Jurnal Kesehatan Ilmiah Indonesia*, 4(2), 140–145.
- Sherani, A., Solihati, & Septimar, Z. M. (2023). Hubungan Tingkat Pengetahuan Pola Makan Dengan Kejadian Penyakit Diabetes Melitus di RW03 Pasar Baru. *Gudang Jurnal Ilmu Kesehatan*, 1, 6–9. <https://doi.org/https://doi.org/10.59435/gjik.v1i1.97>
- Sun, H., Saeedi, P., Karuranga, S., Pinkepank, M., Ogurtsova, K., Duncan, B. B., Stein, C., Basit, A., Chan, J. C. N., Claude Mbanya, J., Pavkov, M. E., Ramachandaran, A., Wild, S. H., James, S., Herman, W. H., Zhang, P., Bommer, C., Kuo, S., Boyko, E. J., & Magliano, D. J. (2023). Erratum to “IDF Diabetes Atlas: Global, Regional and Country-Level Diabetes Prevalence Estimates for 2021 and Projections for 2045.” *Diabetes Research and Clinical Practice*, 204(October), 110945. <https://doi.org/10.1016/j.diabres.2023.110945>
- Susilowati, A. A., & Waskita, K. N. (2019). Pengaruh Pola Makan Terhadap Potensi Resiko Penyakit Diabetes Melitus. *Jurnal Mandala Pharmacoon Indonesia*, 5(01), 43–47. <https://doi.org/10.35311/jmpi.v5i01.43>
- Sutomo, & Purwanto, N. H. (2023). Pengaruh Konsumsi Tisane Daun Belimbing Wuluh Terhadap Perubahan Kadar Gula dalam Darah pada Penderita Diabetes Melitus Tipe 2. *Jurnal Keperawatan*, 27(3), 146–148. [https://doi.org/10.1016/s1138-3593\(01\)73932-9](https://doi.org/10.1016/s1138-3593(01)73932-9)

- Tarigan, R. (2022). Hubungan Gaya Hidup dengan Terjadinya Penyakit Diabetes Melitus di RSUD Daerah Dr.R.M Djoelham. *Jurnal Keperawatan Priority*, 5(1), 94-102. <https://doi.org/10.34012/jukep.v5i1.2105>
- Vadila, A., Izhar, M. D., & Nasution, H. S. (2021). Faktor-Faktor Kejadian Diabetes Melitus Tipe 2 Di Puskesmas Putri Ayu. *Media Kesehatan Politeknik Kesehatan Makassar*, 16(2), 229-237.
- Wahyuni, R., Ma'ruf, A., & Mulyono, E. (2019). Hubungan Pola Makan Terhadap Kadar Gula Darah Penderita Diabetes Mellitus. *Jurnal Medika Karya Ilmiah Kesehatan*, 4(2), 1-8. <http://jurnal.stikeswhs.ac.id/index.php/medika>
- Wardhani, A. (2021). Hubungan Pengetahuan dengan Kepatuhan Diet pada Penderita Diabetes Melitus di Wilayah Kerja Puskesmas Astambul 2020. *Jurnal Ilmu Kesehatan Insan Sehat*, 9(1), 10-14. <https://doi.org/10.54004/jikis.v9i1.16>
- Widia, C., & Kurniasih, E. (2024). Peningkatan Edukasi Kepada Masyarakat Mengenai Penyakit Diabetes Mellitus dan Upaya Pencegahan Komplikasinya. *Jurnal Pengabdian Masyarakat (Jupemas)*, 5(1), 40-47. <https://doi.org/10.36465/jupemas.v5i1.1288>
- Widiyoga, C. R., Saichudin, & Andiana, O. (2020). Hubungan Tingkat Pengetahuan tentang Penyakit Diabetes Melitus pada Penderita terhadap Pengaturan Pola Makan dan Physical Activity. *Sport Science and Health*, 2(2), 152-161.
- Yuliani, Y., & Nugroho, P. S. (2022). Resiko Perilaku Konsumsi Fast ast Food dan Soft Drink Berlebih dengan Kejadian Obesitas pada Remaja di Laos. *Borneo Student Research (BSR)*, 3(2), 1810-1818.