

CHAPTER I

INTRODUCTION

1.1 Research Background

Diabetes Mellitus (DM) is currently considered one of the major global health threats. According to the International Diabetes Federation (IDF), in 2021, 537 million adults aged 20 to 79 were diagnosed with DM. This number is projected to rise to 783 million by 2045.¹ The World Health Organization has predicted that the number of patients with type 2 diabetes in Indonesia will increase significantly, from 8.4 million in 2000 to 21.3 million by 2030.² According to the Indonesian Health Survey data in 2023, the prevalence of DM in East Java Province was 2.2%, or 130,683 people. In comparison, the overall prevalence of DM in Indonesia stood at 1.7%.³ In Ngawi Regency, the DM population in 2022 was recorded at 28,432 individuals.⁴ Specifically, the population of those with Type 2 DM in Kedunggalar was 802 people.⁵

Risk factors for type 2 DM can be categorized into two groups: unchangeable and changeable risk factors. Unchangeable risk factors include age and genetics, while changeable risk factors encompass obesity, diet, sleep patterns, physical activity, and stress management. Additionally, certain lifestyle choices, elevated blood pressure, and dietary habits such as the consumption of junk food and sugary beverages contribute to the risk of developing type 2 diabetes.⁶

¹ IDF, *IDF Diabetes Atlas IDF Diabetes Atlas*, ed. Dianna J Magliano Edward J'0- Boyko, Phil Riley Suvi Karuranga, Lorenzo Piemonte, and Hong Sun Pouya Saeedi, 10 th edit (IDF, 2021), www.diabetesatlas.org.

² PERKENI, "Pedoman Pengelolaan Dan Pencegahan Diabetes Melitus Tipe 2 Dewasa Di Indonesia 2021," in *PERKENI*, 1st ed. (Indonesia: PB. Perkeni, 2021), 1–119.

³ Kemenkes, "Survei Kesehatan Indonesi Dalam Angka Dalam Angka," *SKI*, 2020, 1–68.

⁴ Dinas jawa timur Kesehatan, "Profil Kesehatan Provinsi Jawa Timur Tahun 2022," *Dinkes Jawa Timur*, 2022, 1–214, WWW.DINKES.JATIMPROV.GO.ID.

⁵ BPS Kabupaten Ngawi, "Kecamatan Kedunggalar Dalam Angka," in *BPS Kabupaten Ngawi*, ed. Priyatno Subandi, 1st ed. (ngawi: BPS Kabupaten Ngawi, 2022), 6.

⁶ Zurriyani Said Aandy Saida, "Faktor-Faktor Yang Mempengaruhi Kejadian Penyakit Diabetes Mellitus Tipe 2 Di Gampong Keude Krueng Geukeuh Aceh Utara," *Jurnal Sains Riset* 11, no. November (2021): 610–19, <https://doi.org/10.47647/jsr.v10i12>.

Research by Roniawan et al. (2021) indicates a connection between blood sugar levels and blood pressure in patients with type 2 DM.⁷ The mechanisms underlying the relationship between blood pressure and type 2 DM involve several factors, including insulin resistance, systemic inflammation, endothelial dysfunction, and activation of the sympathetic nervous system.⁸ Additionally, the link between blood pressure and the onset of type 2 diabetes is partly due to the thickening of arterial walls, which narrows the diameter of blood vessels. This narrowing can disrupt the transportation of glucose from the bloodstream, potentially leading to hyperglycemia and the development of type 2 DM.⁹

The consumption of junk food significantly impacts energy imbalance and has a direct correlation with type 2 DM. According to research by Herbert Wau (2021), the frequency of junk food consumption a substantial role in the incidence of type 2 DM.¹⁰ Junk foods, such as fast food, are typically processed with high levels of salt and sugar, which can disrupt the body's metabolism, contribute to fat accumulation, and raise blood sugar levels. This can ultimately lead to insulin resistance, a major risk factor for developing type 2 DM.¹¹ Moreover, the high sugar content in sugary drinks can further elevate blood sugar levels, interference with insulin function leads to insulin resistance, which disrupts the body's metabolism and increases the risk of complications associated with DM.¹²

⁷ Habib Fatah Roniawan, Peppy Octaviani DM, and Rani Prabandari, "Hubungan Kadar Gula Darah Dengan Tekanan Darah Pasien Diabetes Melitus Tipe 2 Di Puskesmas Sokaraja 1," *Jurnal Farmasi & Sains Indonesia* 4, no. 2 (2021): 74–78, <https://doi.org/10.52216/jfsi.vol4no2p74-78>.

⁸ Sri Dewi Gusti Ningsih et al., "Hubungan Kadar Gula Darah Dengan Tekanan Darah Pada Penderita Diabetes Tipe 2 Di Rsu. Royal Prima Medan," *Malahayati Health Studen Journal* 4 (2024): 4195–4208, <https://doi.org/10.33024/mahesa.v4i8.15168>.

⁹ Yohanes Firmansyah, Ernawati Ernawati, and Evy Luciana Prawiro, "Sistem Skoring Untuk Memprediksi Kejadian Hipertensi Pada Usia Produktif Di Kota Medan (Preliminary Study)," *Jurnal Muara Sains, Teknologi, Kedokteran Dan Ilmu Kesehatan* 4, no. 1 (2020): 55, <https://doi.org/10.24912/jmstkik.v4i1.6013>.

¹⁰ Herbert Wau, *Pengaruh Junk Food, Soft Drink Dan Obesitas Terhadap Penyakit Diabetes Melitus, Analytical Biochemistry*, vol. 11, 2021

¹¹ Rika Rusmawati, Martini Listrikawati, and Lalu M Panji Azali, "Hubungan Konsumsi Junkfood Dan Pola Aktivitas Fisik Riwayat Keluarga Diabetes Melitus Di SMA Muhammadiyah 1 Karanganyar" 131 (2023): 1–15.

¹² Novi Susanti et al., "Hubungan Antara Konsumsi Minuman Manis Buatan Dan Faktor Risiko Penyakit Diabetes Pada Remaja Di Mtsswasta Alwasliyah Pancur Batu," *PREPOTIF: Jurnal Kesehatan Masyarakat* 8, no. 2 (2024): 34460–61.

Research by Firmansyah et al. (2020) indicates that diet plays a significant role in the potential risk of DM. Individuals who consume salty foods are 2.62 times more likely to develop DM, and 65% of respondents who eat salty foods report experiencing DM.¹³ While everyone requires salt, fat, sugar, and carbohydrates in their diet, excessive consumption of these substances can accumulate in the body and negatively impact health.¹⁴ Sodium, which is found in high amounts in salty foods, contributes to fluid retention and can lead to hypertension, a key risk factor for developing DM.¹⁵

The consumption of junk food, which is high in fat, salt, and sugar, is linked to elevated blood sugar levels. An ongoing imbalance between the intake of energy-dense foods and energy expenditure due to physical activity can result in obesity, insulin resistance, and type 2 DM. Intake of fat a crucial role in maintaining insulin sensitivity, while excessive fat intake can decrease insulin sensitivity.¹⁶ The recommended daily limits are 1,500 milligrams of salt, 50 grams of sugar, and 75 grams of fat.¹⁷

Recommended Dietary Allowance was the standard for the average nutritional needs that had to be met daily by individuals based on age, gender, activity level, and physiological conditions (such as pregnancy or breastfeeding). Recommended Dietary Allowance was used as a reference to assess a person's nutritional adequacy and to assist in planning a healthy and balanced diet. Recommended Dietary Allowance was applied at the

¹³ Arikha Ayu Susilowati and Kuncara Nata Waskita, "Pengaruh Pola Makan Terhadap Potensi Resiko Penyakit Diabetes Melitus," *Jurnal Mandala Pharmacon Indonesia* 5, no. 01 (2019): 43–47, <https://doi.org/10.35311/jmpi.v5i01.43>.

¹⁴ Dewi Sartika MS et al., "Hubungan Konsumsi Gula Dan Konsumsi Garam Dengan Kejadian Diabetes Mellitus," *Holistik Jurnal Kesehatan* 17, no. 5 (2023): 388–94, <https://doi.org/10.33024/hjk.v17i5.12007>.

¹⁵ Firmansyah, Ernawati, and Prawiro, "Sistem Skoring Untuk Memprediksi Kejadian Hipertensi Pada Usia Produktif Di Kota Medan (Preliminary Study)."

¹⁶ Elly Kuwanti, Ichsan Budiharto, and Ikbil Fradianto, "Hubungan Pola Makan Dengan Kadar Gula Darah Penderita Diabetes Melitus Tipe 2 : Literature Review," *MAHESA : Malahayati Health Student Journal* 3, no. 6 (2023): 1736–50, <https://doi.org/10.33024/mahesa.v3i6.10495>.

¹⁷

consumption level, covering the adequacy of energy, protein, fat, carbohydrates, fibre, water, vitamins, and minerals.¹⁸

Surah Al'araf, verse 31, explains that Muslims are not encouraged to do everything in excess, especially in terms of eating and drinking. Maintaining a healthy food pattern keeps our bodies awake and healthy. The Qur'an also explains various verses that encourage humans to support health not only in physical but also in spiritual terms.¹⁹ Therefore, Islam regulates consumption, and in fulfilling daily needs, one must choose between the benefits of a need or the satisfaction of a mere desire that is not necessarily clear, such as the blessings and benefits of a person's resources. Based on this background, the researcher wants to know 'the relationship between blood pressure and the history of eating *junk food* habits with the incidence of Type 2 DM at the Kedunggalar Health Center'.

1.2 Research Problem

Is there a relationship between blood pressure and a history of *junk food* eating habits with the incidence of Type 2 DM at Kedunggalar Health Center?

1.3 Research Objectives

1. General objective

Knowing the relationship between blood pressure and a history of eating junk food with the incidence of type 2 DM at Kedunggalar Health Centre.

2. Specific objectives

- 1) Knowing the respondent's characteristics.
- 2) Analysing the relationship between blood pressure and the incidence of type 2 DM at Kedunggalar Health Centre.

¹⁸ Kemenkes, "Angka Kecukupan Gizi Yang Dianjurkan Untuk Masyarakat Indonesia," *Kemenkes*, no. 28 (2019): 1–33.

¹⁹ Winda Sri Wahyuni, "Konsep Kesehatan Terhadap Pola Makanan Pada Tubuh Menurut Ayat Al-Qur'an," 2023, Windasriwahyuni1512@Gmail.Com.

- 3) Analysing the relationship between historical junk food consumption and the prevalence of type 2 DM at Kedunggalar Health Center.

1.4 Research benefits

1. Theoretical benefits

The result from the research are intended to serve as a valuable source of information and to support the theories of nutritionists, particularly regarding the relationship between blood pressure, junk food eating habits, and type 2 DM at the Kedunggalar Health Center.

1.5 Practical benefits

- 1) For DM Patients

It is hoped that the research results can be used by patients as a guideline for maintaining a healthy lifestyle, such as regulating junk food intake and maintaining good sleep patterns, to prevent degenerative diseases.

- 2) For the nutritionist profession

It is anticipated that the study's results will help educate patients about the link between blood pressure, junk food consumption habits, and type 2 DM, ultimately aiding in prevention efforts.

1.6 Authenticity of Research

Table 1. Authenticity of Research

Research title	Research Type	Variable	Results	Differences in research
Hubungan konsumsi junk food dan pola aktivitas fisik dengan kadar gula darah siswa dengan riwayat keluarga diabetes melitus di SMA Muhammadiyah 1 Karanganyar ²⁰	Observational analytics with cross-sectional study design	Dependent variable: blood sugar levels and nutritional status Independent variables: junk food consumption and physical activity	Consumption of junk food who get results in moderate junk food consumption of as much as 66.2%, with a p-value = 0.166 (>0.05).	Dependent variable: Type 2 DM Independent variable: Blood pressure Methods: Case-control
Analisis faktor Risiko yang berhubungan dengan kejadian diabetes melitus tipe 2 di wilayah kerja puskesmas Oespa Kota Kupang tahun 2023 ²¹	case control	The dependent variable: Type 2 diabetes mellitus Independent variables: Family history, hypertension, and physical activity	The results showed a significant relationship between family history (p-value = 0.002; OR = 4.462), hypertension (p-value = 0.004; OR = 4.063) and physical activity (p-value = 0.029; OR = 2.941).	Independent variables: Blood pressure and junk food
Hubungan Pola Konsumsi Softdrink dengan kejadian DM Tipe 2 pada Lansia di Puskesmas Wawonasa ²²	Descriptive Crossectional	Dependent variable: Type 2 DM Independent variable: soft drink consumption pattern	Results From the statistical results of Chi-Square, the p-value = 0.000 is smaller than the α = 0.05 value, which means that there is a relationship between the Sofdrink Consumption Pattern and the Incidence of Type 2 DM in the Elderly at the Wawonasa Health Centre.	Independent variables: Blood pressure and food consumption Methods: Case-control

²⁰ Rusmawati, Listrikawati, and Azali, "Hubungan Konsumsi Junkfood Dan Pola Aktivitas Fisik Riwayat Keluarga Diabetes Melitus Di SMA Muhammadiyah 1 Karanganyar."

²¹ Yuliana Febriani Parera, Indriati A. Tedju Hinga, and Yuliana Radja Riwu, "Analisis Faktor Risiko Yang Berhubungan Dengan Kejadian Diabetes Melitus Tipe 2 Di Wilayah Kerja Puskesmas Oesapa Kota Kupang Tahun 2023," *SEHATMAS: Jurnal Ilmiah Kesehatan Masyarakat* 2, no. 4 (2023): 991–1000, <https://doi.org/10.55123/sehatmas.v2i4.2516>.

²² Zulnindy Aringaneng et al., "Hubungan Pola Konsumsi Softdrink Dengan Kejadian DM Tipe 2 Pada Lansia Di Puskesmas Wawonasa," *Jurnal Kesehatan Amanah* 2, no. 1 (2023): 138–44.

Hubungan Tekanan Darah Penderita Diabetes Melitus Tipe 2 dengan kejadian Retinopati Diabetik di RSUD Al-Ihsan Bandung ²³	Observational analytical, quantitative research method Case Control research design	Diabetic Retinopathy dependent variable Independent variable: Blood Pressure	The chi-square test showed a p-value <0.0001, and the OdsRatio test obtained 6.7. there is an association between hypertension and the incidence of diabetic retinopathy at Al-Ihsan Hospital.	Independent variable: History of junk food eating habits
Riwayat keluarga dan Hipertensi dengan kejadian Diabetes Melitus tipe II ²⁴	Analytical observational with case control approach	Dependent variable: type 2 diabetes mellitus Independent Variables: Family History and Hypertension	The results showed that there was a relationship between family history and the incidence of type II diabetes mellitus with a value of p = 0.001, OR = 11.074, there was a relationship between hypertension and the incidence of type II diabetes mellitus with a value of p = 0.004, OR = 7.857.	Independent variables: Blood pressure and food consumption

²³ Cika Lailatus Sholihah, Suganda Tanuwidjaja, and Ismawati, "Hubungan Tekanan Darah Penderita Diabetes Melitus Tipe 2 Dengan Kejadian Retinopati Diabetik Di RSUD Al-Ihsan Bandung," *Bandung Conference Series: Medical Science* 4, no. 1 (2024): 568–73, <https://doi.org/10.29313/bcsms.v4i1.11170>.

²⁴ Dwi Rahayu Rediningsih and Ita Puji Lestari, "Riwayat Keluarga Dan Hipertensi Dengan Kejadian Diabetes Melitus Tipe II," *Jppkmi* 3, no. 1 (2022): 8–13, <https://journal.unnes.ac.id/sju/index.php/jppkmi>.