Assessment of Obesity, Comorbidities and Associated Factors among Women Aged 35–45 in Dhaka City

Dr. Sabrin Khan Mou[1], Dr. Asma Ul Hosna[2]*, Rantu Das[3], Dr. Meharun Nesa Moly[4], Dr. Md. Nazrul Islam[5], Prof. Dr. Taslima Akter[6], Siam Ashraf[7]

Abstract

Background: Obesity is an emerging public health concern in urban Bangladesh, particularly among middle-aged women, where it contributes to an increasing burden of non-communicable diseases. Local evidence on obesity rates, determinants and comorbidity profiles for mid-life urban women has traditionally been sparse, hindering targeted interventions. This study aimed to assess the prevalence of obesity, examine sociodemographic determinants and describe associated comorbidities among women aged 35–45 years in Dhaka City. Methods: A community-based cross-sectional study was conducted on 322 women residing in Dhaka City. Data were collected through structured interviews and standardized anthropometric measurements. Obesity was classified according to standardized criteria. Associations between obesity and sociodemographic variables were examined using chi-square tests, odds ratios with 95% confidence intervals. Results: The prevalence of obesity was 39.13%. Women aged 35–40 years had significantly higher odds of obesity than those aged 41–45 years (OR = 3.41; 95% CI: 2.10–5.53; p < .001). Graduate-level education was significantly protective against obesity (OR = 0.43; 95% CI: 0.27–0.69; p = .001), whereas marital status was not significantly associated. Obese women had a markedly higher prevalence of diabetes (63.5%), hypertension (65.9%), fatty liver disease (65.1%), heart disease (48.4%), joint pain (61.9%), breathlessness or chest pain (56.3%) and kidney disease (46.0%) than non-obese women. Conclusion: Obesity imposes a substantial health burden on urban women aged 35–45 years in Dhaka City and is strongly associated with multiple chronic conditions. Targeted preventive and management strategies are essential to mitigate its growing effects.

Keywords: Obesity, Non-communicable diseases, Women, Urban health, Bangladesh.

***Corresponding Author:** Dr. Asma Ul Hosna*

Introduction

Obesity is defined by the World Health Organization as abnormal or excessive fat accumulation that presents a health risk [1]. Over the past three decades, obesity has transitioned from a condition largely confined to high-income countries to a global public health emergency affecting low- and middle-income nations, including Bangladesh [2]. Rapid urbanization, economic transition, dietary shifts and sedentary lifestyles have accelerated this epidemiological shift, particularly among women living in metropolitan settings [3].

Bangladesh is currently experiencing a pronounced nutrition transition characterized by coexistence of undernutrition and rising overweight and obesity [4]. National survey data

---

[1] Student (WMPH), Jahangirnagar University, Dhaka, Bangladesh
[2] Associate Professor, Department of Obstetrics and Gynaecology, Bangladesh Medical University, Dhaka, Bangladesh, Email: asmaulhosnalucky@gmail.com
[3] Student (WMPH), Jahangirnagar University, Dhaka, Bangladesh
[4] HMO, Department of Dermatology-Skin & VD, Dhaka Medical College and Hospital, Dhaka, Bangladesh
[5] Associate Professor, Department of Pediatric Surgery, Bangladesh Medical University, Dhaka, Bangladesh.
[6] Professor, Department of Microbiology, Holly family Red Cresent Medical College and Hospital, Dhaka, Bangladesh
[7] Medical Student, Sir Salimullah Medical College, Dhaka, Bangladesh.

demonstrate that overweight and obesity among women of reproductive age have increased substantially over the last decade, with urban populations exhibiting the highest burden. Evidence indicates that adult women residing in cities such as Dhaka face increased exposure to energy-dense diets, limited opportunities for physical activity and sociocultural constraints that influence health behaviors [5].

Mid-life women aged 35–45 years represent a particularly vulnerable demographic group. This stage of life is associated with hormonal transitions, metabolic alterations, weight retention following childbirth and cumulative exposure to lifestyle risk factors [6]. Physiological changes, including reduced estrogen levels approaching menopause, contribute to central fat redistribution and increased cardiometabolic risk [7]. Concurrently, urban occupational patterns and caregiving responsibilities often reduce physical activity, further predisposing women in this age group to obesity [5].

The health consequences of obesity extend beyond excess body weight. It is a major modifiable risk factor for type 2 diabetes mellitus, hypertension, cardiovascular disease, fatty liver disease, osteoarthritis and chronic kidney disease [8,9]. Studies conducted in Bangladesh have reported that overweight and obese women are significantly more likely to develop hypertension and diabetes compared with their normal-weight counterparts [5,10]. Central adiposity, which is common among South Asian women even at lower body mass index levels, further amplifies cardiometabolic vulnerability [11].

Despite growing national data, there remains a shortage of localized, population-specific evidence focusing exclusively on mid-life urban women. Most existing analyses rely on nationally representative surveys that do not disaggregate findings for this critical age group within metropolitan contexts. Dhaka city, characterized by high population density, environmental stressors, limited recreational space and dietary westernization, presents a unique urban environment that may intensify obesity risk and related comorbidities [5].

Understanding the magnitude of obesity and its associated conditions in women aged 35–45 years is essential for targeted public health interventions. Quantifying socio-demographic determinants alongside comorbidity profiles provides evidence necessary for gender-sensitive screening, prevention and integrated non-communicable disease management strategies.

Therefore, this study aimed to assess the prevalence of obesity, examine its association with selected socio-demographic factors and evaluate the burden of major non-communicable comorbidities among women aged 35–45 years residing in Dhaka city.

Materials & Methods

This was a community-based cross-sectional analytical study conducted among women residing in Dhaka City. The study included 322 women aged 35–45 years. Data were collected from selected urban communities during the study period specified in the thesis. The target population comprised middle-aged urban women representing diverse educational and marital backgrounds.

Eligibility Criteria:
Inclusion Criteria
- Women aged 35–45 years
- Permanent residents of the selected areas of Dhaka City
- Provided informed consent

Exclusion Criteria

- Pregnant women
- Women with severe illness preventing participation

Data Collection Procedure

Data were collected through face-to-face interviews using a structured questionnaire. The instrument captured socio-demographic characteristics, medical history and presence of comorbid conditions including diabetes, hypertension, heart disease, fatty liver disease, joint pain, breathlessness or chest pain and kidney disease. Anthropometric measurements were performed using standardized procedures. Body weight was measured with a calibrated scale and height was recorded using a stadiometer. Obesity classification was determined using standardized anthropometric criteria as described in the thesis. Information regarding comorbidities was obtained based on reported diagnosis and structured health-related questioning. Data collection procedures ensured consistency, completeness and accuracy.

Ethical Considerations

Ethical approval was obtained from the appropriate authority as described in the thesis. Informed consent was obtained from all participants. Confidentiality was maintained throughout data handling and reporting.

Statistical Analysis

Data were analyzed using appropriate statistical software as described in the thesis. Descriptive statistics summarized socio-demographic variables and obesity prevalence. Associations between categorical variables were examined using chi-square tests. For 2×2 tables, odds ratios (OR) and 95% confidence intervals were calculated. A p-value < 0.05 was considered statistically significant.

Results
Table 1. Baseline Socio-demographic Characteristics (N = 322)

Variable	Category	Frequency (n)	Percentage (%)
Age Group	35–40	214	66.46
	41–45	108	33.54
Marital Status	Married	281	87.27
	Single	17	5.28
	Divorced/Separated	12	3.73
	Widowed	12	3.73
Education Level	Graduate and above	116	36.02
	Higher Secondary	63	19.57
	Secondary	51	15.84
	Primary	51	15.84
	No formal education	41	12.73

Table 1 presents the baseline socio-demographic characteristics of the study population. Among the participants, 66.46% (n = 214) were aged 35–40 years, while 33.54% (n = 108) were aged 41–45 years. The majority were married (87.27%, n = 281), with smaller proportions single (5.28%, n = 17), divorced/separated (3.73%, n = 12), or widowed (3.73%, n = 12). Regarding education, 36.02% (n = 116) had graduate-level education or above, followed by higher

secondary (19.57%, n = 63), secondary (15.84%, n = 51), primary (15.84%, n = 51) and no formal education (12.73%, n = 41).

Table 2. Prevalence of Obesity (N = 322)

Obesity Status	Frequency (n)	Percentage (%)
Normal	196	60.87
Obesity	126	39.13

Table 2 shows the prevalence of obesity among the participants. Of the total sample, 39.13% (n = 126) were classified as obese, whereas 60.87% (n = 196) were non-obese.

Table 3. Distribution of Obesity by Age Group

Age Group	Obese (n)	Non-Obese (n)	Total	Odds Ratio (95% CI)	P-value
35–40	96	73	169	3.41 (2.10–5.53)	
41–45	30	123	153		<0.001
Total	126	196	322		

Table 3 describes the distribution of obesity according to age group. Among women aged 35–40 years, 96 were obese and 73 were non-obese, whereas among those aged 41–45 years, 30 were obese and 123 were non-obese. The association between age group and obesity was statistically significant (p < .001). The calculated odds ratio was 3.41 (95% CI: 2.10–5.53).

Table 4. Distribution of Obesity by Marital Status (Single vs Others)

Marital Status	Obese n	Non-Obese n	Total	Odds Ratio (95% CI)	P-value
Single	11	23	34	0.51 (0.19–1.36)	
Others	115	173	288		0.265
Total	126	196	322		

Table 4 presents the distribution of obesity by marital status, categorized as single versus others. Among single women, 11 were obese and 23 were non-obese. In the "others" category, 115 were obese and 173 were non-obese. The association between marital status and obesity was not statistically significant (p = .265). The odds ratio was 0.51 (95% CI: 0.19–1.36).

Table 5. Obesity by Educational Attainment (Graduate and Above vs Others)

Group	Obese (n)	Non-Obese (n)	Total	Odds Ratio (95% CI)	P-value
Graduate+	27	108	135	0.43 (0.27–0.69)	
Others	99	88	187		0.001
Total	126	196	322		

Table 5 shows obesity status by educational attainment, comparing women with graduate-level education or above to those with lower education. Among women with graduate-level education, 27 were obese and 108 were non-obese. Among those with lower education, 99 were obese and

88 were non-obese. The association was statistically significant (p = .001). The odds ratio was 0.43 (95% CI: 0.27–0.69).
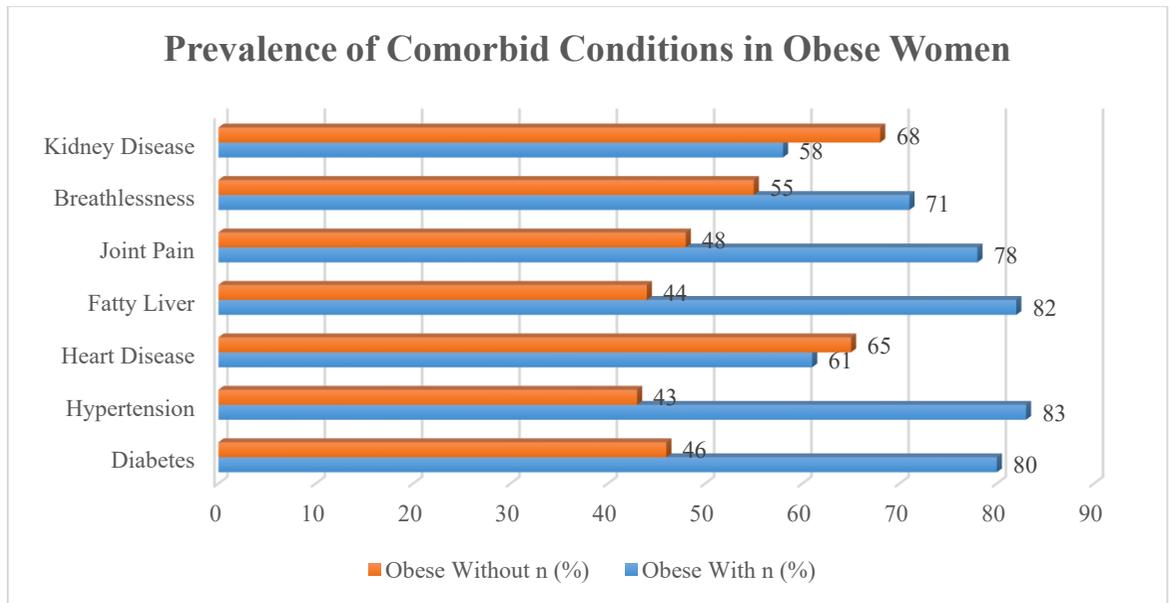

Figure 1: Prevalence of Comorbid Conditions in Obese Women

Figure 1 illustrates the prevalence of selected comorbid conditions among obese women. The highest prevalence was observed for hypertension (65.9%) and fatty liver disease (65.1%), followed closely by diabetes (63.5%). Joint pain was reported by 61.9% of obese participants, breathlessness or chest pain by 56.3%, heart disease by 48.4% and kidney disease by 46.0%.
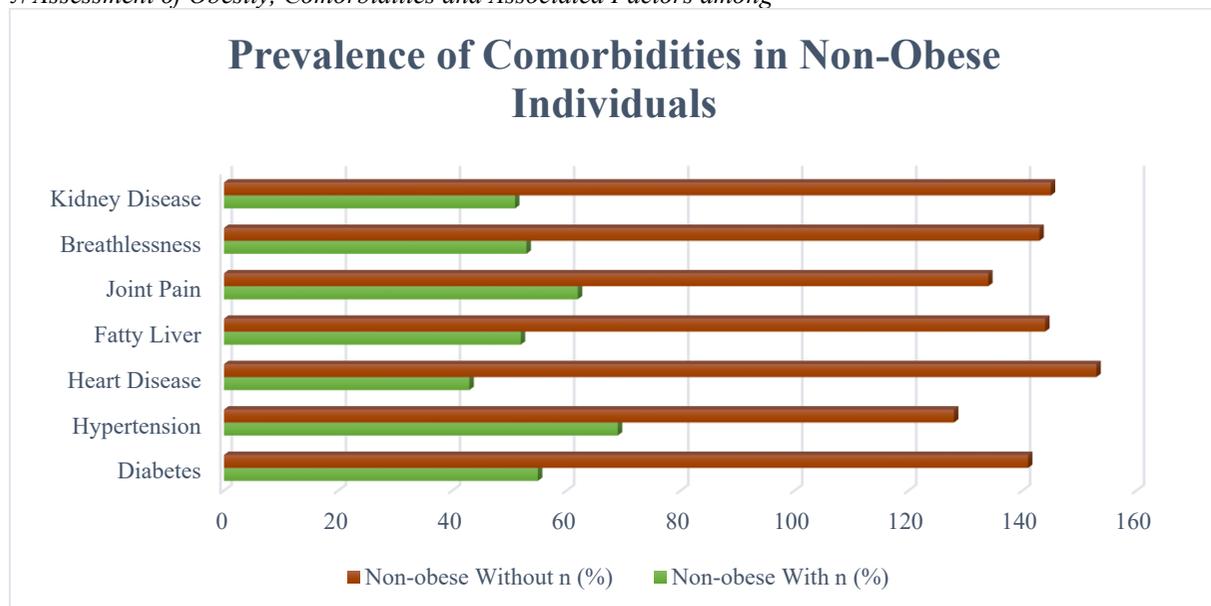
Prevalence of Comorbidities in Non-Obese Individuals

Figure 2: Prevalence of Comorbid Conditions in Non-Obese Women

Figure 2 depicts the prevalence of the same comorbid conditions among non-obese women. Hypertension was reported by 35.2%, diabetes by 28.1%, fatty liver disease by 26.5%, joint pain by 31.6%, breathlessness or chest pain by 27.0%, heart disease by 21.9% and kidney disease by 26.0%. Across all listed conditions, the reported prevalence was lower among non-obese women compared with obese women.

Discussion

The present study assessed the prevalence of obesity and its association with socio-demographic factors and selected comorbid conditions among women aged 35–45 years residing in Dhaka city. The findings revealed that 39.13% of the participants were obese, indicating a substantial burden within this urban female population. This observation reflects the ongoing nutritional and epidemiological transition occurring in Bangladesh, where rapid urbanization and lifestyle changes are contributing to increasing rates of overweight and obesity. National analyses have similarly reported rising trends of obesity among Bangladeshi women, particularly in urban settings where sedentary occupations and dietary shifts are more common [12]. Ahmed et al. also documented a growing prevalence of overweight and obesity among Bangladeshi women across different age groups, emphasizing the influence of socio-economic development and lifestyle modification on body weight patterns [13].

The study identified a statistically significant association between age group and obesity. Women aged 35–40 years exhibited significantly higher odds of obesity compared with those aged 41–45 years. This pattern may reflect cumulative weight gain during early mid-life, which can result from multiple interacting biological and behavioral factors. Physiological transitions during mid-life may further influence body composition changes. Hormonal fluctuations associated with the menopausal transition have been shown to alter fat distribution and metabolic processes, thereby increasing susceptibility to obesity-related complications [7].

Journal of Posthumanism

Marital status did not demonstrate a statistically significant association with obesity in this study. Although most participants were married, the analysis suggested that marital status alone did not independently influence obesity risk within this population. Similar findings have been reported in studies conducted among Bangladeshi women, where marital status showed limited explanatory power once socio-economic and behavioral variables were considered [4]. In urban settings, factors such as employment patterns, household responsibilities and access to health information may exert stronger influences on body weight than marital status itself.

Educational attainment demonstrated a significant protective association against obesity. Women with graduate-level education had lower odds of obesity compared with those with lower educational attainment. This finding supports previous research indicating that education plays a critical role in shaping health behaviors and lifestyle choices. Kamal et al. reported that women with higher education levels are more likely to adopt healthier dietary practices, engage in physical activity and access preventive healthcare services [14]. Similarly, Hossain et al. observed that educational attainment among urban Bangladeshi women was inversely associated with obesity, highlighting the importance of health literacy and socio-economic empowerment in reducing obesity risk [15]. Higher education may also enhance awareness of non-communicable disease risk factors, thereby encouraging healthier lifestyle behaviors.

A major finding of the present study was the high prevalence of non-communicable comorbidities among obese women. Hypertension, fatty liver disease and diabetes were particularly common, affecting more than half of obese participants. In contrast, the prevalence of these conditions was substantially lower among non-obese women. These findings are consistent with established evidence linking obesity to metabolic and cardiovascular diseases. The Global Burden of Disease study has identified elevated body mass index as one of the leading contributors to morbidity and mortality worldwide, particularly through its role in cardiometabolic disorders [16]. Hall et al. explained that obesity contributes to hypertension through multiple mechanisms, including activation of neurohumoral pathways, increased sympathetic nervous system activity and renal sodium retention [17].

The high prevalence of diabetes observed among obese participants further highlights the metabolic consequences of excess adiposity. Obesity is strongly associated with insulin resistance, which represents a central pathophysiological mechanism underlying type 2 diabetes mellitus. Bhowmik et al. reported that the burden of diabetes in Bangladesh has increased significantly in parallel with rising obesity prevalence, particularly among urban populations [10]. Excess adipose tissue promotes chronic low-grade inflammation and altered glucose metabolism, thereby increasing susceptibility to diabetes and related metabolic complications.

Fatty liver disease was also highly prevalent among obese participants in the present study. Non-alcoholic fatty liver disease is widely recognized as a hepatic manifestation of metabolic syndrome and is strongly associated with central adiposity. Studies among South Asian populations have demonstrated a heightened vulnerability to visceral fat accumulation even at relatively moderate body mass index levels [11]. Khan et al. further emphasized that central adiposity is an important predictor of cardiometabolic risk among Bangladeshi women, underscoring the need for early identification and preventive strategies targeting abdominal obesity [18].

Musculoskeletal complaints, including joint pain, were also common among obese women in this study. Excess body weight increases mechanical stress on weight-bearing joints and contributes to degenerative joint changes over time. Previous research has demonstrated that obesity is associated with higher risks of osteoarthritis and reduced physical mobility, which may further

limit physical activity and perpetuate weight gain [26].

Collectively, the findings highlight the interrelated nature of obesity and non-communicable diseases among urban mid-life women. Dhaka city represents a rapidly changing urban environment characterized by dense population, limited recreational infrastructure and lifestyle patterns that may promote physical inactivity and unhealthy dietary habits. Kabir et al. have emphasized that the growing burden of non-communicable diseases in Bangladesh poses significant challenges for health systems, particularly in urban areas where lifestyle-related risk factors are highly prevalent [20].

These results underscore the importance of targeted public health interventions aimed at preventing obesity and managing associated comorbidities among urban women. Strategies should focus on promoting healthy dietary practices, increasing opportunities for physical activity and strengthening community-based screening programs for early detection of metabolic disorders. Addressing socio-demographic determinants such as education and health literacy may also play an important role in reducing obesity-related health risks among women in this age group.

Limitations of the study

This study employed a cross-sectional design, which limited causal inferences between obesity and comorbid conditions. Reliance on reported diagnosis of comorbidities may introduce reporting bias. Additionally, the study was conducted in selected areas of Dhaka City and may not be generalizable to rural populations or other age groups.

Conclusion

Obesity affects two-fifths of women aged 35–45 years in Dhaka City and is associated with age and educational attainment. Graduate-level education was associated with a lower risk of obesity, whereas marital status was not. Obese women had a higher prevalence of diabetes, hypertension, heart disease, fatty liver disease, joint pain, breathlessness or chest pain and kidney disease than non-obese women. These associations underscore obesity as a key contributor to the non-communicable disease burden in urban women in midlife. Targeted prevention, screening and integrated management strategies are required to address this challenge.

Conflicts of interest: There are no conflicts of interest.

Ethical Approval: This Study Approved by the Jahangirnagar University Ethical Review Committee.

References

World Health Organization. Obesity and overweight. Geneva: WHO; 2022.

Ng M, Fleming T, Robinson M, Thomson B, Graetz N, Margono C, Mullany EC, Biryukov S, Abbafati C, Abera SF, Abraham JP. Global, regional and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013. The lancet. 2014 Aug 30;384(9945):766-81.

Popkin BM, Corvalan C, Grummer-Strawn LM. Dynamics of the double burden of malnutrition and the changing nutrition reality. The Lancet. 2020 Jan 4;395(10217):65-74.

Biswas T, Uddin MJ, Mamun AA, Pervin S, P Garnett S. Increasing prevalence of overweight and obesity in Bangladeshi women of reproductive age: findings from 2004 to 2014. PloS one. 2017 Jul 28;12(7): e0181080.

Tanwi TS, Chakrabarty S, Hasanuzzaman S, Saltmarsh S, Winn S. Socioeconomic correlates of overweight and obesity among ever-married urban women in Bangladesh. BMC public health. 2019 Jun 28;19(1):842.

Malik VS, Willet WC, Hu FB. Nearly a decade on—trends, risk factors and policy implications in global obesity. Nature Reviews Endocrinology. 2020 Nov;16(11):615-6.

Lovejoy JC. The influence of sex hormones on obesity across the female life span. Journal of Women's Health. 1998 Dec;7(10):1247-56.

Hruby A, Hu FB. The epidemiology of obesity: a big picture. Pharmacoeconomics. 2015 Jul;33(7):673-89.

Kahn SE, Hull RL, Utzschneider KM. Mechanisms linking obesity to insulin resistance and type 2 diabetes. Nature. 2006 Dec 14;444(7121):840-6.

Bhowmik B, Afsana F, Diep LM, Munir SB, Wright E, Mahmood S, Khan AA, Hussain A. Increasing prevalence of type 2 diabetes in a rural Bangladeshi population: a population-based study for 10 years. Diabetes & metabolism journal. 2013 Feb 15;37(1):46.

Akter S, Rahman MM, Abe SK, Sultana P. Prevalence of diabetes and prediabetes and their risk factors among Bangladeshi adults: a nationwide survey. Bulletin of the World Health Organization. 2014 Jan 10; 92:204-13A.

Chowdhury MA, Adnan MM, Hassan MZ. Trends, prevalence and risk factors of overweight and obesity among women of reproductive age in Bangladesh: a pooled analysis of five national cross-sectional surveys. BMJ open. 2018 Jul 1;8(7): e018468.

Ahmed MS, Khan S, Islam M, Islam MI, Hossain MM, Khan B, Yunus FM. Prevalence, inequality and associated factors of overweight/obesity among Bangladeshi adolescents aged 15–19 years. International Health. 2024 Nov;16(6):670-7.

Kamal SM, Hassan CH, Alam GM. Dual burden of underweight and overweight among women in Bangladesh: patterns, prevalence and sociodemographic correlates. Journal of health, population and nutrition. 2015 Mar;33(1):92.

Hossain MM, Islam MR, Sarkar AS, Khan MM, Taneepanichskul S. Prevalence and determinants risk factors of underweight and overweight among women in Bangladesh. Obesity Medicine. 2018 Sep 1; 11:1-5.

Murray CJ, Aravkin AY, Zheng P, Abbafati C, Abbas KM, Abbasi-Kangevari M, Abd-Allah F, Abdelalim A, Abdollahi M, Abdollahpour I, Abegaz KH. Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. The lancet. 2020 Oct 17;396(10258):1223-49.

JE H. do Carmo JM, da Silva AA, Wang Z, Hall ME. Obesity-induced hypertension: interaction of neurohumoral and renal mechanisms. Circ Res. 2015 Mar 13;116(6):991-1006.

Khan RJ, Harvey DJ, Leistikow BN, Haque KS, Stewart CP. Relationship between obesity and coronary heart disease among urban Bangladeshi men and women. Integrative obesity and diabetes. 2015 May 25;1(3):49.

Luppino FS, de Wit LM, Bouvy PF, Stijnen T, Cuijpers P, Penninx BW, Zitman FG. Overweight, obesity and depression: a systematic review and meta-analysis of longitudinal studies. Archives of general psychiatry. 2010 Mar 1;67(3):220-9.

Kabir, A., Karim, M. N., & Billah, B. (2022). Health system challenges and opportunities in organizing non-communicable diseases services delivery at primary healthcare level in Bangladesh: A qualitative study. *Frontiers in public health*, *10*, 1015245. https://doi.org/10.3389/fpubh.2022.1015245

.