ARC Journal of Public Health and Community Medicine
Volume 10 Issue 3, 2025, PP 1-7
ISSN No. (Online) 2456-0596
DOI: https://doi.org/10.20431/2456-0596.1003001
www.arcjournals.org

Correlation between Sociodemographic Factors and Diabetes Management Indicators among Patients at Khadimpara Hospital

Dr. Nusrat Arefin[1*], Dr. Md Azharul Islam[2], Dr Rezaul Karim Shaon[3], Dr. Anamika Panthadas[4]

[1]*Upazila Health & Family Planning Officer, Upazila Health Complex, Chhatak, Sunamganj, Bangladesh.*

[2]*Department of Junior Clinical Fellow (JCF) Emergency, Whittington Health NHS Trust, United Kingdom.*

[3]*Medical Officer, Department of Pediatrics, Kulhudhuffushi Regional Hospital Ministry, Maldives.*

[4]*Lecturer, Department of Anatomy, Parkview Medical College, Sylhet, Bangladesh.*

Received: 14 July 2025 Accepted: 28 July 2025 Published: 05 August 2025

Corresponding Author:** ***Dr. Nusrat Arefin, *Upazila Health & Family Planning Officer, Upazila Health Complex, Chhatak, Sunamganj, Bangladesh.*

Abstract

Background: *Despite global advances in diabetes care, limited research has examined how sociodemographic factors specifically influence diabetes management in low-resource settings like Bangladesh. The purpose of this study was to assess the relationship between sociodemographic characteristics and key diabetes management indicators among patients receiving care at Khadimpara Hospital.*

Aim of the study: *The aim of the study was to evaluate the relationship between sociodemographic characteristics and key diabetes management indicators among patients receiving care at Khadimpara Hospital.*

Methods: *This cross-sectional quantitative study by the Department of Public Health at Khadimpara 31-Bed Hospital, Sylhet (July–December 2024) enrolled 221 diabetic patients aged 35–65 via convenience sampling. Data were collected using a validated Bengali questionnaire and glucose measured by Ecom GOD glucometer. Analysis used SPSS 23 with descriptive stats, chi-square, and Spearman's correlation ($p < 0.05$).*

Results: *Among 221 diabetic patients (mean age 54.6 years), 51.1% were female, 50.2% housewives, and 48.9% earned 10,000–20,000 BDT/month. BMI was normal in 47.5%, underweight in 34.8%, and overweight in 16.7%. Family history was reported by 73.8%, complications by 86.9%, and 79.6% had controlled diabetes. BMI negatively correlated with gender ($r = –0.260$) and occupation ($r = –0.186$). Complications positively correlated with gender ($r = 0.192$), occupation ($r = 0.210$), and family history ($r = 0.164$). Control methods correlated with income ($r = 0.192$) and family history ($r = 0.229$).*

Conclusion: *Sociodemographic factors significantly influence diabetes management and complication risks, underscoring the need for personalized care approaches.*

Keywords: *Sociodemographic Factors, Diabetes Management, Glycemic Control*

1. Introduction

Diabetes mellitus (DM) is a chronic condition characterized by the body's impaired ability to produce or effectively use insulin, a hormone secreted by the pancreas that facilitates glucose uptake from the bloodstream into cells [1]. According to the World Health Organization (WHO) in 2016, approximately 422 million adults worldwide are living with diabetes, meaning about one in every eleven people is affected. The global prevalence of diabetes has nearly doubled since 1980, rising from 4.7% to 8.5% among adults, and it is projected that by 2035, around 592 million people will have the disease [2, 3]. Within South Asia, Bangladesh ranks second in the number of diabetes patients, with an estimated 5.1 million adults (6.31%) living with diabetes [4]. In Bangladesh specifically, the prevalence is estimated at approximately 8%, or about 12.88 million people [5]. Over recent decades, type 2 diabetes mellitus (T2DM) has seen a rapid increase worldwide and poses a significant public health challenge due to its complex nature and rising incidence.

Individuals with diabetes require lifelong care to reduce the risk of developing chronic complications. Although diabetes is a persistent condition without a complete cure, patients can

lead normal lives by effectively managing the disease through a balanced diet, adherence to prescribed medications, regular physical activity, and consistent blood glucose monitoring [6, 7]. Poorly controlled diabetes may result in serious long-term health issues such as cardiovascular disease, stroke, and diabetic retinopathy leading to blindness, kidney damage, and eventual renal failure [8, 9]. Awareness of key risk factors—including age, gender, and education level, place of residence, body mass index (BMI), obesity, family history, and sedentary lifestyle—is crucial for both prevention and treatment [10]. Understanding the socio-demographic characteristics of patients at tertiary care centers is vital for designing effective management and early intervention strategies. Such efforts can significantly reduce diabetes-related morbidity and mortality while also lessening the financial burden on individuals and society as a whole.

Comprehensive knowledge of diabetes risk factors—such as age, gender, educational level, residential area, BMI, obesity, family history, and lack of physical activity—is essential for successful prevention and treatment. Moreover, financial, psychological, and environmental influences also play significant roles, both directly and indirectly, in the management and outcomes of diabetes [11]. The onset of type 2 diabetes mellitus (T2DM) is influenced by a combination of anthropometric measures (such as height, weight, and body fat percentage), demographic characteristics (including age, gender, income, education, occupation, and marital status), and genetic predispositions. Since diabetes requires largely self-managed care—accounting for approximately 99% of the treatment regimen—various social, economic, and demographic factors also serve as important considerations in assessing risks for poor glycemic control among diabetic individuals [12, 13]. Notably, lower socioeconomic status is associated with a higher risk of prediabetes and T2DM, especially in high-income countries. However, the influence of socio-demographic factors on diabetes management among diabetic populations in Bangladesh and the broader South Asian region remains underexplored.

Despite global advances in diabetes care, limited research has examined how sociodemographic factors specifically influence diabetes management in low-resource settings like Bangladesh. While international studies have highlighted the role of socioeconomic status, education, and lifestyle in glycemic control, the contextual relevance of these findings to rural or semi-urban Bangladeshi populations remains unclear. Evidence from regional or community-level health facilities is particularly scarce. The purpose of the study was to assess the relationship between sociodemographic characteristics and key diabetes management indicators among patients receiving care at Khadimpara Hospital.

2. Objective

- To evaluate the relationship between sociodemographic characteristics and key diabetes management indicators among patients receiving care at Khadimpara Hospital.

3. Methodology & Materials

This cross-sectional quantitative study was conducted by the Department of Public Health at Khadimpara 31-Bed Hospital, Sylhet, Bangladesh, from July to December 2024. A total of 221 patients diagnosed with diabetes mellitus were enrolled through convenience sampling based on predefined eligibility criteria to assess the relationship between sociodemographic factors and diabetes management indicators.

3.1. Inclusion Criteria

- Adults aged 35 to 65 years
- Both male and female participants
- Individuals who provided informed consent

3.2. Exclusion Criteria

- Patients with uncontrolled diabetes mellitus
- Presence of comorbidities beyond uncomplicated diabetes-related complications
- Individuals with critical pre-existing medical conditions or recent major injuries

Data were collected using a semi-structured, pretested questionnaire in Bengali, developed through forward and backward translation to ensure cultural appropriateness. The tool captured sociodemographic information (age, gender, marital status, education, occupation, residence, income, BMI) and clinical details. Blood glucose levels were measured using a validated Ecom GOD enzyme-type glucometer following standard protocols. Independent variables included sociodemographic and anthropometric characteristics, while dependent variables encompassed glycemic control and diabetes-related complications.

Data were analyzed using SPSS version 23, applying descriptive statistics, chi-square tests,

and Spearman's correlation, with significance set at $p < 0.05$. Ethical approval was obtained from the Ethical Committee of Khadimpara 31-Bed Hospital, Sylhet. Tool validity was ensured through expert review, and data integrity was maintained through standardized collection and entry procedures. The dataset is securely stored and available upon request.

4. Results

Table 1. *Sociodemographic Characteristics among Diabetes Mellitus Patients (n = 221)*

Variable		Frequency (n)	Percentage (%)
Age Category (In years)	25–40 Years	29	13.1
	41–50 Years	65	29.4
	51–60 Years	76	34.4
	61–70 Years	36	16.3
	71–80 Years	9	4.1
	81–90 Years	6	2.7
	Mean ± SD	54.61 ± 10.89	
Gender	Male	108	48.9
	Female	113	51.1
Religion	Islam	209	94.6%
	Hindu	12	5.4%
	Christian	0	0.0%
	Buddhism	0	0.0%
	Others	0	0.0%
Occupation	Service Holder	34	15.4
	Business Man	53	24.0
	Farmer	23	10.4
	Housewife	111	50.2
Monthly Income	< 10,000 BDT	50	22.6
	10,000–20,000 BDT	108	48.9
	20,000–30,000 BDT	50	22.6
	> 30,000 BDT	13	5.9

Table 1 presents the sociodemographic profile of 221 patients with diabetes. The mean age was 54.61 ± 10.89 years, with the highest frequency (n = 76; 34.4%) in the 51–60 year age group, followed by 41–50 years (n = 65; 29.4%). Females comprised slightly more than half of the participants (n = 113; 51.1%), while males accounted for 48.9% (n = 108). A significant majority of the respondents were Muslim (n = 209; 94.6%), and no participants identified as Christian, Buddhist, or other religions. In terms of occupation, housewives were the most common (n = 111; 50.2%), followed by businessmen (n = 53; 24.0%) and service holders (n = 34; 15.4%).

Regarding monthly income, nearly half earned between 10,000–20,000 BDT (n = 108; 48.9%), while a smaller portion (n = 13; 5.9%) had a monthly income exceeding 30,000 BDT.

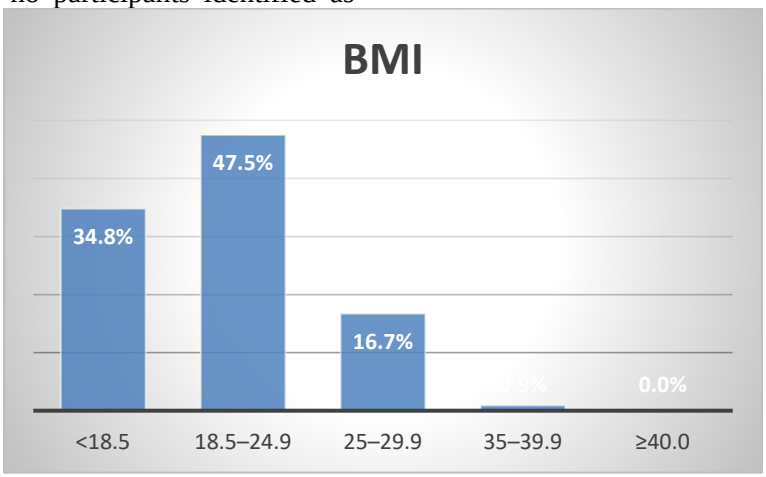

Figure 1. *Distribution of BMI Categories among Diabetes Mellitus Patients*

Figure 1 illustrates the distribution of body mass index (BMI) categories among patients with diabetes. Nearly half of the participants (47.5%) had a normal BMI (18.5–24.9), while 34.8% were underweight (<18.5). A smaller proportion (16.7%) fell into the overweight category (25–29.9), and only 0.9% were classified as obese (BMI 35–39.9).

No individuals were found in the morbidly obese category (BMI ≥40.0), indicating a predominance of undernutrition and normal weight status within the study population.

Table 2. *Clinical Information of Diabetes Mellitus Patients (n = 221)*

Variable		Frequency (n)	Percentage (%)
Family History of DM	Yes	163	73.8
	No	58	26.2
Problem with DM	Yes	192	86.9
	No	29	13.1
DM Control	Yes	176	79.6
	No	45	20.4

A majority (73.8%) reported a family history of diabetes mellitus, highlighting potential genetic predisposition. Most participants (86.9%) experienced diabetes-related problems, suggesting a high burden of disease complications. Notably, 79.6% reported their diabetes was under control, indicating effective management in a significant portion of the population.

Table 3. *Correlation of Sociodemographic Factors with Diabetes Management Indicators among Patients (n = 221)*

Variables			Gender	Religion	Occupation	Income	Family History of DM
Spearman's rho	**BMI**	**r**	-.260**	0.081	-.186**	-0.051	-0.024
		Sig. (2-tailed)	0	0.228	0.005	0.448	0.719
		N	221	221	221	221	221
	Anti-DM Drug Duration	**r**	0.008	0.048	0.058	-0.103	-0.087
		Sig. (2-tailed)	0.909	0.482	0.388	0.128	0.200
		N	221	221	221	221	221
	Problem with DM	**r**	.192**	0.025	.210**	0.061	.164*
		Sig. (2-tailed)	0.004	0.71	0.002	0.367	0.015
		N	221	221	221	221	221
	Controlling Method of DM	**r**	0.047	0	.153*	.192**	.229**
		Sig. (2-tailed)	0.484	0.997	0.023	0.004	0.001
		N	221	221	221	221	221
	Diabetes Control	**r**	0.045	-0.022	0.094	0.028	0.056
		Sig. (2-tailed)	0.508	0.745	0.162	0.675	0.408
		N	221	221	221	221	221

Table 3 presents the correlation between sociodemographic factors and diabetes management indicators among the 221 patients. BMI showed a significant negative correlation with gender (r = –0.260, p<0. indicating that males and individuals in certain occupations tended to have lower BMI compared to females and other occupational groups.

No significant correlations were observed between BMI and religion, income, or family history of diabetes. Diabetes-related complications positively correlated with gender (r = 0.192, p<0.01), occupation (r = 0.210, p<0.01), and family history (r = 0.164, p<0.05), suggesting a higher complication risk among women, specific occupational groups, and those with familial predisposition. Methods used to control diabetes showed positive correlations with income (r = 0.192, p<0.01) and family history (r = 0.229, p<0.01), reflecting a greater adoption of comprehensive management strategies among these groups.

5. Discussion

The influence of sociodemographic factors on diabetes management 01) and occupation (r = –0.186, p<0.01), Indicators among patients at a primary care hospital in Bangladesh. Diabetes mellitus, a chronic metabolic disorder, demands consistent management to prevent long-term complications. The findings reflect how variables such as age, education level, income, and

occupation correlate with glycemic control, body mass index, and diabetes-related complications. These results emphasize the need for tailored public health interventions that consider socioeconomic diversity to improve diabetes outcomes in resource-limited settings.

In this study, the majority of diabetes mellitus patients were within the 51–60 year age group, with a mean age of approximately 55 years, aligning with national data showing increasing diabetes prevalence with age [14]. Female participants slightly outnumbered males, reflecting findings from a nationally representative Bangladeshi study which reported higher diabetes risk among women, particularly those unemployed or engaged in household work. In this sample, over 50% were housewives, reinforcing the gendered burden of diabetes noted in prior literature. Additionally, occupation and income status emerged as influential factors, consistent with the findings of Razon et al. [15], who observed significant associations between these sociodemographic variables and clinical outcomes among diabetic patients. The predominance of individuals from lower to middle-income brackets in this study also echoes broader evidence linking economic status with diabetes risk and management disparities.

In this study, nearly half (47.5%) of the diabetic patients had a normal BMI (18.5–24.9), while a strikingly high proportion (34.8%) were underweight (<18.5), and only 16.7% were categorized as overweight (25–29.9), with very few falling into obese ranges. These findings resonate with Rahman et al.[16], who reported that approximately one-third of Bangladeshi adults were underweight, suggesting a persistent burden of undernutrition even among individuals with diabetes. Furthermore, their observation that moderately overweight individuals showed similar risks for diabetes and hypertension as those meeting standard overweight criteria aligns with the pattern seen in this study, where normal-weight individuals made up the majority despite being diabetic. In contrast, Banik et al. [17] found higher overweight and obesity rates (34.4% and 11.4%, respectively), indicating some variability in weight distribution among diabetic populations depending on sample characteristics. Overall, the predominance of normal and underweight individuals in our cohort underscores the complexity of diabetes in Bangladesh, where both under- and over-nutrition coexist within the same clinical spectrum.

In this study, a substantial majority of diabetic patients (73.8%) reported a family history of diabetes, underscoring the strong genetic predisposition within the population. A high prevalence of diabetes-related complications was also observed, with 86.9% of patients experiencing problems related to their condition.

This aligns with findings by Shuvo et al. [18] in Jashore District, Bangladesh, where 41.4% of diabetic patients had comorbid conditions such as hypertension and retinopathy, highlighting the burden of complications among diabetic populations in the country. Additionally, nearly 80% of patients in this cohort reported having their diabetes under control, which is notably higher than some previous reports but indicates ongoing challenges in achieving optimal management for the remaining 20.4% with uncontrolled diabetes. These findings emphasize the critical need for comprehensive diabetes care that addresses both genetic risk factors and effective complication management.

In this study, BMI exhibited a significant negative correlation with gender and occupation, indicating that males and individuals in specific occupational groups were more likely to have higher BMI levels. Interestingly, males with diabetes mellitus tend to have lower BMI than females, although higher BMI remains significantly associated with diabetes mellitus, as supported by Kautzky-Willer et al. [19]. In contrast, no significant correlations were found between BMI and religious affiliation, income, or family history of diabetes, which aligns with Kyrou et al. [20] who also reported a lack of notable association between these sociodemographic factors and diabetes. The presence of diabetes-related complications showed a significant positive correlation with gender ($p < 0.01$), occupation ($p < 0.01$), and family history of diabetes ($p < 0.05$). Gender has been recognized as a major risk factor influencing diabetes mellitus and glycemic control, with occupation and family history playing important roles in hyperglycemia management [21]. These findings suggest that women, certain occupational groups, and individuals with a family history of diabetes are more susceptible to diabetes-related complications. Additionally, methods used to control diabetes correlated positively with income ($p < 0.01$) and family history ($p < 0.01$), indicating that patients with higher income levels and familial predisposition are more likely to adopt comprehensive diabetes management

strategies. Supporting this, Islam et al. [22] found that sociodemographic factors such as age, education, and comorbidities significantly correlate with type 2 diabetes mellitus (T2DM) in Bangladesh, with age and education notably impacting blood sugar levels. Likewise, Chowdhury et al. [23] reported that older age, higher socioeconomic status, and educational attainment were significant correlates of T2DM, reinforcing the importance of sociodemographic factors including age, income, and education in diabetes management observed in this study.

6. Limitations Of The Study

The study had several limitations:

- The study did not identify predictive factors for Diabetes Mellitus.
- Use of non-probability sampling limits the generalizability of the findings.
- The study could not establish associations between diabetic and non-diabetic populations.
- Participants did not have consistent sociodemographic characteristics, affecting uniformity.
- Future research should utilize larger datasets for more robust analysis.
- Follow-up and cohort studies are recommended for comprehensive insights.

7. Conclusion

This study demonstrates significant relationships between sociodemographic factors and diabetes management indicators among patients at Khadimpara Hospital. Age, gender, occupation, income, and family history play important roles in influencing BMI, diabetes-related complications, and management approaches. Females, certain occupational groups, and those with a family history of diabetes showed higher risks of complications, while higher income and familial predisposition were linked to more comprehensive diabetes control methods. These findings highlight the need for tailored diabetes care strategies that consider patients' sociodemographic backgrounds to improve outcomes in this population.

References

[1] Ta S. Diagnosis and classification of diabetes mellitus. Diabetes care. 2014 Jan 1; 37(1):81-90.

[2] Roglic G, editor. Global report on diabetes. World Health Organization; 2016.

[3] Federation ID, Atlas ID. International diabetes federation. IDF diabetes atlas, 6th edn Brussels, Belgium: International Diabetes Federation. 2013.

[4] World Diabetic Day 2016. Altius Directory. Available from: https://www.altiusdirectory. com/Society/ world-diabetes-day.php

[5] World Health Organization. Diabetes country profiles, 2016: Bangladesh. France: WHO. 2016.

[6] Jermendy G, Hungarian RECAP Group not@ valid. com, Erdesz D, Nagy L, Yin D, Phatak H, Karve S, Engel S, Balkrishnan R. Outcomes of adding second hypoglycemic drug after metformin monotherapy failure among type 2 diabetes in Hungary. Health and Quality of Life Outcomes. 2008 Oct 31; 6(1):88.

[7] Mier N, Bocanegra-Alonso A, Zhan D, Zuniga MA, Acosta RI. Health-related quality of life in a binational population with diabetes at the Texas-Mexico border. Revista Panamericana de Salud Pública. 2008; 23:154-63.

[8] Khan MM, Gruebner O, Kraemer A. The geography of diabetes among the general adults aged 35 years and older in Bangladesh: recent evidence from a cross-sectional survey. PLoS One. 2014 Oct 30; 9(10):e110756.

[9] Abueleinen KG, El-Mekawey H, Saif YS, Khafagy A, Rizk HI, Eltahlawy EM. Sociodemographic factors responsible for blindness in diabetic Egyptian patients. Clinical Ophthalmology. 2011 Nov 7:1593-8.

[10] Dudzinska M, Tarach JS, Zwolak A, Kurowska M, Malicka J, Smolen A, Nowakowski A. Type 2 diabetes mellitus in relation to place of residence: evaluation of selected aspects of socio-demographic status, course of diabetes and quality of life–a cross-sectional study. Annals of Agricultural and Environmental Medicine. 2013; 20(4).

[11] Gonzalez-Zacarias AA, Mavarez-Martinez A, Arias-Morales CE, Stoicea N, Rogers B. Impact of demographic, socioeconomic, and psychological factors on glycemic self-management in adults with type 2 diabetes mellitus. Frontiers in public health. 2016 Sep 12; 4:195.

[12] Gohel JB, Sharma D, Patel NB, Raswan US, Patil S. A study of socio demographic and clinical profile of cases of diabetic foot. Nat J Med Res. 2012; 2:279-81.

[13] Huang MF, Courtney M, Edwards H, McDowell J. Factors that affect health outcomes in adults with type 2 diabetes: A cross-sectional study. International journal of nursing studies. 2010 May 1; 47(5):542-9.

[14] Suhel SA, Akther N, Islam S, Dhor NR, Ahmed M, and Hossain A. Assessment of sex disparities in prevalence of diagnosed and undiagnosed diabetes mellitus: results from the Bangladesh

demographic and health survey data. BMC Endocr Disord. 2024 Dec 18; 24(1):265.

[15] Razon AH, Biswas S, Hossain S, Khatun A, Sagufta JF, Barsha TS, Zohra FT. A comprehensive analysis of behavioral patterns, socioeconomic conditions, and the prevalence of diabetes associated comorbidities among diabetic patients in Bangladesh. Public Health Toxicology. 2025 Jun 18; 5(2):1-0.

[16] Rahman M, Williams G, Mamun AA. Hypertension and diabetes prevalence among adults with moderately increased BMI (23·0-24·9 kg/m2): findings from a nationwide survey in Bangladesh. Public Health Nutr. 2017 Jun; 20(8):1343-1350.

[17] Banik PC, Mondal R, Hussain A. Overweight and obesity among the urban and rural type 2 diabetic subjects in Bangladesh. Journal of Xiangya Medicine. 2020 Dec 25; 5.

[18] Shuvo SD, Hossen MT, Riazuddin M, Hossain MS, Mazumdar S, Parvin R, Elahi MT. Prevalence of comorbidities and its associated factors among type-2 diabetes patients: a hospital-based study in Jashore District, Bangladesh. BMJ open. 2023 Sep 1; 13(9):e076261.

[19] Kautzky-Willer A, Leutner M, Harreiter J. Sex differences in type 2 diabetes. Diabetologia. 2023 Jun; 66(6):986-1002.

[20] Kyrou I, Tsigos C, Mavrogianni C, Cardon G, Van Stappen V, Latomme J, Kivelä J, Wikström K, Tsochev K, Nanasi A, Semanova C. Sociodemographic and lifestyle-related risk factors for identifying vulnerable groups for type 2 diabetes: a narrative review with emphasis on data from Europe. BMC endocrine disorders. 2020 Mar 12; 20(Suppl 1):134.

[21] Ciarambino T, Crispino P, Leto G, Mastrolorenzo E, Para O, Giordano M. Influence of gender in diabetes mellitus and its complication. International journal of molecular sciences. 2022 Aug 9; 23(16):8850.

[22] Islam MR. Association between socio-demographic factors and blood sugar levels in type 2 diabetes mellitus patients in Bangladesh. Journal of diabetes mellitus. 2017 Jul 11; 7(3):151-9.

[23] Chowdhury MA, Uddin MJ, Khan HM, Haque MR. Type 2 diabetes and its correlates among adults in Bangladesh: a population based study. BMC Public Health. 2015 Oct 19; 15(1):1070.

Citation: *Dr. Nusrat Arefin et al. Correlation between Sociodemographic Factors and Diabetes Management Indicators among Patients at Khadimpara Hospital. ARC Journal of Public Health and Community Medicine. 2025; 10(3):1-7. DOI: https://doi.org/10.20431/2456-0596.1003001.*