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SOCIOECONOMIC DETERMINANTS OF TYPE 2 DIABETES-RELATED OUT-OF-POCKET EXPENDITURE IN VIJAYAWADA CITY OF ANDHRA PRADESH

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ABSTRACT

Type 2 diabetes has emerged as one of the most economically demanding chronic conditions in India, generating sustained out-of-pocket expenditure that disproportionately affects urban middle-income households. The present study examines the socioeconomic determinants of Type 2 diabetes-related out-of-pocket expenditure among patients in Vijayawada, with special reference to gender-based differences in the underlying patterns of care-seeking and cost burden. The study is based on primary data collected from 309 Type 2 diabetes patients aged 30 years and above, using a structured questionnaire, comprising 192 male respondents (62 per cent) and 117 female respondents (38 per cent). The analysis focuses on the age profile of patients, monthly household income, educational status, duration of diabetes since diagnosis, the type of healthcare facility primarily used and average monthly out-of-pocket expenditure on diabetes care. Descriptive statistical tools such as percentage analysis were used for data interpretation. The findings reveal that the patient sample is concentrated in the productive middle-age band of 36 to 55 years, with the median age computed at approximately 48 years. A substantial majority of patients belong to the lower-middle and middle income brackets, are moderately educated and have lived with diabetes for two to ten years. Private hospitals and clinics emerge as the dominant source of care, and monthly out-of-pocket expenditure clusters in the Rs. 2,500 to Rs. 5,000 range, with a meaningful minority spending in excess of Rs. 10,000. Female respondents demonstrate higher utilisation of private hospital care and higher out-of-pocket expenditure relative to their male counterparts, reflecting gender-differentiated patterns in chronic disease financing among urban households in tier-2 Andhra Pradesh.

KEYWORDS: *Type 2 Diabetes, Out-of-Pocket Expenditure, Socioeconomic Determinants, Catastrophic Health Spending, Vijayawada*

At the global level, Type 2 diabetes mellitus has become one of the most pressing non-communicable disease burdens of the twenty-first century. The International Diabetes Federation estimates that more than 537 million adults worldwide live with diabetes, with the bulk of the burden concentrated in low- and middle-income countries. The chronic, lifelong nature of the disease, combined with its propensity to generate microvascular and macrovascular complications, makes diabetes one of the most economically demanding conditions for both households and health systems. Across developed economies, the cost burden is largely absorbed by social insurance and tax-funded health systems, whereas in developing economies a substantial share of diabetes-related expenditure continues to be financed directly by patients and their families through out-of-pocket payments.

In the Indian context, Type 2 diabetes has emerged as a major public health and economic challenge. The Indian Council of Medical Research INDIAB study and successive National Family Health Surveys have documented a steady increase in diabetes prevalence across both urban and rural India, with particularly high concentrations in southern states including Andhra Pradesh, Tamil Nadu and Kerala. India accounts for approximately one-sixth of the global diabetes population and is projected to remain among the top three countries by disease burden through the next two decades. Public financing of chronic disease care, however, has not kept pace with this epidemiological transition. While schemes such as Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana at the national level and Dr. YSR Aarogyasri in Andhra Pradesh have expanded inpatient coverage substantially, recurring outpatient diabetes management — including medications, consultations, laboratory monitoring and lifestyle support — continues to be predominantly financed out of pocket.

The transition from acute and infectious disease management to long-term chronic care represents a fundamental structural shift in the economic anatomy of healthcare for Indian households. Acute illness imposes episodic and often time-bound financial demands, whereas Type 2 diabetes generates a continuous, multi-decade stream of expenditure that begins with diagnosis and intensifies with disease duration and the onset of complications. The financial burden is further amplified by the price gradient across health-care providers, the limited coverage of chronic outpatient care by public insurance and the influence of socioeconomic status on care-seeking behaviour. Consequently, diabetes-related out-of-pocket expenditure is

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increasingly recognised not merely as a personal financial issue but as a household-level economic determinant affecting savings, consumption and welfare.

Looking ahead, the economic burden of Type 2 diabetes in India is expected to rise further, driven by ageing population structures, urbanisation, sedentary lifestyles and the earlier age of disease onset relative to Western populations. The growing share of younger adults presenting with Type 2 diabetes in their thirties and forties carries particularly significant economic implications, as it extends the cumulative duration of expenditure across the productive life span. Simultaneously, the cost of diabetes care continues to grow with the introduction of newer therapeutic classes, evolving clinical guidelines and rising prices of laboratory diagnostics. While public initiatives, generic medicine schemes and Jan Aushadhi outlets have begun to alleviate some pressure, the persistence of high out-of-pocket spending highlights the unfinished agenda of chronic disease financing in India.

The proliferation of Type 2 diabetes among middle-aged adults in urban India has substantially altered household-level economic decisions. Vijayawada, as a rapidly growing urban centre in Andhra Pradesh with a diverse income mix, a mature private health-care sector and substantial penetration of the state's Aarogyasri scheme, provides a relevant setting in which to examine these dynamics. The question of how socioeconomic factors such as age, household income, educational status, disease duration and choice of health-care facility shape the magnitude of out-of-pocket expenditure on Type 2 diabetes management therefore warrants systematic empirical examination at the city level.

REVIEW OF LITERATURE

Shobhana et al. (2000) examined the expenditure on health care incurred by diabetic subjects in southern India through a cross-sectional study of patients attending a tertiary diabetes centre in Chennai. The study found that diabetes care imposed a significant economic burden on Indian households, with expenditure rising sharply for patients with disease complications. The findings established an early empirical baseline for measuring diabetes-related household expenditure in the Indian context.

Ramachandran et al. (2007) studied the increasing expenditure on health care incurred by diabetic subjects in India through a follow-up survey at the Diabetes Research Centre, Chennai. The study found a substantial rise in the annual cost of diabetes care over the preceding decade, with particularly steep increases for patients with longer disease duration and complications. The study recommended urgent attention to the financial protection of households managing chronic diabetes.

Tharkar et al. (2010) analysed the socioeconomics of diabetes in a developing country through a population-based cost-of-illness study in Chennai. The study reported that out-of-pocket expenditure on diabetes care consumed a disproportionate share of household income, particularly among lower-income groups. The findings highlight the regressive nature of diabetes financing in the Indian context and the urgent need for risk pooling mechanisms.

Engelgau et al. (2011) examined the economic implications of the demographic and epidemiological transition in South Asia. The study argues that non-communicable diseases including diabetes are emerging as the dominant driver of out-of-pocket health expenditure and household impoverishment in the region. It recommends a comprehensive policy framework integrating prevention, primary care strengthening and financial protection.

Akari, Mateti and Kunduru (2013) conducted a cost-of-illness study of diabetes in a tertiary care hospital in South India. The study found that medication costs constituted the single largest component of total diabetes expenditure, followed by hospitalisation, laboratory investigations and consultation fees. The study noted that the relative share of these components varies substantially across socioeconomic groups and disease severity levels.

Yesudian, Grepstad, Visintin and Ferrario (2014) reviewed the economic burden of diabetes in India through a systematic synthesis of published studies. The review concluded that diabetes-related expenditure in India is high, regressive and rising, with substantial cost differentials between urban and rural settings and between public and private providers. The study calls for standardised cost measurement methodologies and stronger health financing policies.

Tripathy et al. (2016) examined the cost of hospitalisation for non-communicable diseases in India using nationally representative data from the National Sample Survey. The study found that out-of-pocket expenditure for chronic disease hospitalisation was substantial across all income quintiles, with the poor facing disproportionately higher relative burden. The findings reinforce concerns about the equity implications of current health financing arrangements.

Anjana et al. (2017) reported updated findings from the ICMR-INDIAB study on the prevalence of diabetes and prediabetes across Indian states. The study documented marked geographic variations, with Andhra Pradesh, Tamil Nadu and other southern states recording among the highest prevalence rates in the country. The findings underscore the importance of state-level and city-level economic studies on diabetes financing.

Kastor and Mohanty (2018) analysed disease-specific out-of-pocket and catastrophic health expenditure on hospitalisation in India using NSSO data. The study found that diabetes and other chronic non-communicable diseases account for a rising share of household catastrophic expenditure, with significant variations by gender, age, residence and socioeconomic status. The study recommends targeted financial protection for chronic care users.

Pati et al. (2020) examined the relationship between multimorbidity and out-of-pocket expenditure among older adults in India. The study reveals that the co-occurrence of diabetes with other chronic conditions sharply escalates household expenditure, often pushing families into catastrophic spending. The findings highlight the cumulative economic burden experienced by

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middle-aged and older patients managing multiple chronic diseases.

Pradeepa and Mohan (2021) reviewed the epidemiology of Type 2 diabetes in India, drawing on multi-decade evidence from clinical and population studies. The study notes a clear shift toward earlier age of onset, increasing urban prevalence and rising disease burden across socioeconomic strata. The authors emphasise that the economic consequences of these trends are likely to intensify over the coming decade unless addressed through policy reform.

World Health Organization (2016), in its Global Report on Diabetes, documented the rising global burden of the disease and its disproportionate impact on low- and middle-income countries. The report emphasises that out-of-pocket payments remain the dominant mode of diabetes financing in many developing countries and recommends strengthening primary care, expanding access to affordable insulin and integrating chronic care into universal health coverage frameworks.

STATEMENT OF THE PROBLEM

Despite the rapid expansion of literature on diabetes-related expenditure in India, the relationship between socioeconomic determinants and out-of-pocket spending on Type 2 diabetes care remains inadequately studied at the city level, particularly in tier-2 urban centres of Andhra Pradesh. While national and metropolitan studies have provided important aggregate insights, evidence from cities such as Vijayawada is limited, despite the state's high diabetes prevalence and its substantial investment in public health insurance through the Dr. YSR Aarogyasri scheme. The question of whether and to what extent socioeconomic characteristics such as age, household income, educational status, disease duration and provider choice shape the magnitude of diabetes-related out-of-pocket expenditure therefore forms the central concern of this study (Tharkar et al., 2010; Yesudian et al., 2014).

The economic burden of Type 2 diabetes in Indian households operates through multiple structural channels. The chronicity of the disease generates a continuous demand for medications, consultations, laboratory tests and lifestyle support that extends across decades. Public sector facilities offer cost-effective care but face limitations in continuous medication supply, specialised manpower and waiting times, leading many patients to combine public and private providers or rely predominantly on private care. The Aarogyasri scheme, while transformative for inpatient coverage of acute and complex conditions, offers limited support for the recurring outpatient costs that dominate Type 2 diabetes management. As a result, even insured households often bear substantial monthly out-of-pocket expenditure for routine diabetes care, prescription medications and self-monitoring supplies.

The financial burden of diabetes, however, is unlikely to be uniformly distributed across patient populations. Variations are expected to exist based on age and disease duration, with longer-standing patients facing higher cumulative complication costs; based on income and education, with lower-income and less-educated patients potentially experiencing different patterns of access and treatment adherence; and based on gender, given documented differences in care-seeking behaviour, provider selection and household resource allocation. The economic consequences of these socioeconomic differentials matter not only at the individual level but also for the design of health financing policy.

In this context, it becomes essential to systematically examine how Type 2 diabetes patients in Vijayawada are distributed across age, income, educational and disease-duration profiles, what types of health-care facilities they primarily rely on and how monthly out-of-pocket expenditure varies across these socioeconomic categories. A gender-based comparative lens is particularly relevant given persistent evidence of differential access and financing patterns. Understanding these distributions and differences is important for assessing the equity implications of current chronic disease financing arrangements, for identifying segments of the patient population most vulnerable to catastrophic expenditure and for informing locally appropriate financial protection and primary care strengthening initiatives.

OBJECTIVES AND METHODOLOGY

The main objective of the study is to examine the socioeconomic determinants of Type 2 diabetes-related out-of-pocket expenditure among patients in Vijayawada, with special reference to gender-based differences in age profile, household income, educational status, disease duration, type of healthcare facility used and the magnitude of monthly out-of-pocket expenditure.

The study is based on primary data collected from Type 2 diabetes patients residing in Vijayawada city of Andhra Pradesh. A structured questionnaire was used to gather information relating to the age of the patient, monthly household income, educational status, duration of diabetes since diagnosis, the type of healthcare facility primarily used for diabetes management and the average monthly out-of-pocket expenditure on diabetes care including medications, consultations, laboratory investigations and self-monitoring supplies. The respondents were selected through a multi-stage sampling design covering selected outpatient diabetes clinics, general hospital outpatient departments and community pharmacies in Vijayawada, and were classified into two groups based on gender, namely male and female, for comparative analysis. Only respondents aged 30 years and above with a physician-confirmed diagnosis of Type 2 diabetes were included in the study. The total sample size consists of 309 respondents, comprising 192 male respondents (62 per cent) and 117 female respondents (38 per cent). The data collected were systematically coded, tabulated and analysed using simple percentage analysis to examine distribution patterns and gender-based differences across the variables studied.

RESULTS AND DISCUSSION

Age Profile of the Patients

Table – 1 presents the distribution of patients by age across two gender groups, namely male and female. At the overall level, it is observed from the table that 40.45 per cent of the respondents are in the 36 to 45 years age band, while 30.74 per

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cent are in the 46 to 55 years band and 19.42 per cent are in the 56 to 65 years band. About 7.77 per cent are above 65 years of age and only 1.62 per cent are in the 30 to 35 years band, with no respondents below 30 years of age. The median age computed from the data is approximately 48 years, indicating that the patient sample is concentrated in the productive middle-age band consistent with the well-documented age profile of Type 2 diabetes onset in urban India.

Across the strata, with regard to male respondents, 41.67 per cent are in the 36 to 45 years band, while 30.21 per cent are in the 46 to 55 years band and 18.23 per cent are in the 56 to 65 years band. About 8.33 per cent are above 65 years and only 1.56 per cent are in the 30 to 35 years band. In the case of female respondents, 38.46 per cent are in the 36 to 45 years band, while 31.62 per cent are in the 46 to 55 years band and 21.37 per cent are in the 56 to 65 years band. About 6.84 per cent are above 65 years and only 1.71 per cent are in the 30 to 35 years band. A comparison between the two groups reveals that female patients are marginally more concentrated in the 46 to 65 years range, while male patients are slightly more concentrated in the younger 36 to 45 years band.

It can be concluded that the Type 2 diabetes patient population in Vijayawada is predominantly middle-aged, with a median age of approximately 48 years and a strong concentration in the 36 to 55 years productive age band, reflecting the contemporary urban Indian pattern of mid-life Type 2 diabetes onset.

Table – 1
Distribution of the Patients by Age Profile

Gender	30–35 years	36–45 years	46–55 years	56–65 years	Above 65	Total
Male	3 (1.56)	80 (41.67)	58 (30.21)	35 (18.23)	16 (8.33)	192 (100.00)
Female	2 (1.71)	45 (38.46)	37 (31.62)	25 (21.37)	8 (6.84)	117 (100.00)
Total	5 (1.62)	125 (40.45)	95 (30.74)	60 (19.42)	24 (7.77)	309 (100.00)

Note: Figures in the parenthesis represent row percentages.
Source: Computed from the Primary Data.

Monthly Household Income

Table – 2 presents the distribution of patients by monthly household income, classified by gender. On the whole, it is evident from the table that 30.74 per cent of the patients report a monthly household income of Rs. 15,001 to Rs. 30,000, while 29.13 per cent report Rs. 30,001 to Rs. 50,000 and 17.80 per cent report Rs. 50,001 to Rs. 1,00,000. About 14.56 per cent report less than Rs. 15,000 per month and 7.77 per cent report more than Rs. 1,00,000. This indicates that a substantial majority of Type 2 diabetes patients in the sample belong to the lower-middle and middle income brackets, consistent with the broader socioeconomic profile of urban Vijayawada.

Gender wise, it is noticed from the table that among male respondents, 30.21 per cent report household income of Rs. 30,001 to Rs. 50,000, while 29.17 per cent report Rs. 15,001 to Rs. 30,000 and 18.75 per cent report Rs. 50,001 to Rs. 1,00,000. About 13.02 per cent report less than Rs. 15,000 and 8.85 per cent report more than Rs. 1,00,000. In the case of female respondents, 33.33 per cent report household income of Rs. 15,001 to Rs. 30,000, while 27.35 per cent report Rs. 30,001 to Rs. 50,000 and 17.09 per cent report less than Rs. 15,000. About 16.24 per cent report Rs. 50,001 to Rs. 1,00,000 and only 5.99 per cent report more than Rs. 1,00,000. A comparison between the two groups reveals that female patients are more concentrated in the lower income brackets, while male patients are relatively more distributed across the middle and upper income ranges.

These findings suggest that Type 2 diabetes in Vijayawada predominantly affects households of modest economic standing, with female patients drawn disproportionately from lower-income households, raising important questions about the relative affordability burden of chronic disease management across gender.

Table – 2
Distribution of the Patients by Monthly Household Income (in Rs.)

Gender	< 15,000	15,001–30,000	30,001–50,000	50,001–1,00,000	> 1,00,000	Total
Male	25 (13.02)	56 (29.17)	58 (30.21)	36 (18.75)	17 (8.85)	192 (100.00)
Female	20 (17.09)	39 (33.33)	32 (27.35)	19 (16.24)	7 (5.99)	117 (100.00)
Total	45 (14.56)	95 (30.74)	90 (29.13)	55 (17.80)	24 (7.77)	309 (100.00)

Note: Figures in the parenthesis represent row percentages.
Source: Computed from the Primary Data.

Educational Status

Table – 3 presents the distribution of patients by educational status across the two gender groups. By and large, it is observed from the table that 33.98 per cent of the patients are graduates, while 30.74 per cent have completed SSC or intermediate education and 16.18 per cent hold a post-graduate qualification. About 12.30 per cent have schooling below SSC level or no formal education and 6.80 per cent hold a professional or doctoral qualification. This indicates that the patient sample reflects a moderately educated urban population, with a clear concentration in the school-completed to graduate band.

Among male respondents, 34.38 per cent are graduates, 30.21 per cent have completed SSC or intermediate education and 16.67 per cent hold a post-graduate qualification. About 11.46 per cent have schooling below SSC and 7.29 per cent hold a professional or doctoral qualification. In the case of female

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respondents, 33.33 per cent are graduates, 31.62 per cent have completed SSC or intermediate education and 15.38 per cent hold a post-graduate qualification. About 13.68 per cent have schooling below SSC and 5.99 per cent hold a professional or doctoral qualification. A comparison between the two groups reveals broadly similar educational distributions, though female respondents are marginally more represented at the lower end of the educational ladder.

The evidence indicates that Type 2 diabetes in urban Vijayawada cuts across a wide range of educational backgrounds, although the concentration of patients in the school-completed to graduate band suggests important implications for the design of health literacy interventions and patient education programmes.

Table – 3
Distribution of the Patients by Educational Status

Gender	Below SSC	SSC / Inter	Graduate	Post-Graduate	Prof. / Doc.	Total
Male	22 (11.46)	58 (30.21)	66 (34.38)	32 (16.67)	14 (7.29)	192 (100.00)
Female	16 (13.68)	37 (31.62)	39 (33.33)	18 (15.38)	7 (5.99)	117 (100.00)
Total	38 (12.30)	95 (30.74)	105 (33.98)	50 (16.18)	21 (6.80)	309 (100.00)

Note: Figures in the parenthesis represent row percentages.
Source: Computed from the Primary Data.

Duration of Diabetes since Diagnosis

Table – 4 presents the distribution of patients by the duration of diabetes since diagnosis. On the whole, 29.77 per cent of the patients have been living with Type 2 diabetes for 2 to 5 years, while 25.24 per cent have a duration of 6 to 10 years and 17.80 per cent have been diagnosed within the last 2 years. About 15.53 per cent report a disease duration of 11 to 15 years and 11.65 per cent report more than 15 years since diagnosis. This indicates that the patient sample spans the full chronic disease trajectory, from recently diagnosed cases to long-standing patients with substantial cumulative exposure to diabetes-related expenditure.

Across the strata, among male respondents, 30.21 per cent report a disease duration of 2 to 5 years, while 25.00 per cent report 6 to 10 years and 18.23 per cent report less than 2 years. About 15.10 per cent report 11 to 15 years and 11.46 per cent report more than 15 years since diagnosis. In the case of female respondents, 29.06 per cent report a disease duration of 2 to 5 years, while 25.64 per cent report 6 to 10 years and 17.09 per cent report less than 2 years. About 16.24 per cent report 11 to 15 years and 11.97 per cent report more than 15 years since diagnosis. A comparison between the two groups reveals broadly similar disease-duration profiles, with female respondents marginally more concentrated in the longer-duration brackets.

Overall, the pattern reflects that more than half of the patients have been managing diabetes for at least five years, while approximately one in four have a duration exceeding ten years, indicating substantial cumulative exposure to diabetes-related care expenditure across the sample.

Table – 4
Distribution of the Patients by Duration of Diabetes since Diagnosis

Gender	< 2 years	2–5 years	6–10 years	11–15 years	> 15 years	Total
Male	35 (18.23)	58 (30.21)	48 (25.00)	29 (15.10)	22 (11.46)	192 (100.00)
Female	20 (17.09)	34 (29.06)	30 (25.64)	19 (16.24)	14 (11.97)	117 (100.00)
Total	55 (17.80)	92 (29.77)	78 (25.24)	48 (15.53)	36 (11.65)	309 (100.00)

Note: Figures in the parenthesis represent row percentages.
Source: Computed from the Primary Data.

Type of Healthcare Facility Primarily Used

Table – 5 presents the distribution of patients by the type of healthcare facility primarily used for Type 2 diabetes management. It is revealed from the table that 35.60 per cent of the patients primarily rely on private hospitals, while 25.24 per cent depend on government hospitals or primary health centres and 23.30 per cent rely on private clinics or individual practitioners. About 9.06 per cent primarily access charitable or trust hospitals and 6.80 per cent report using multiple sources of care simultaneously. This indicates that the private health-care sector, comprising private hospitals and individual practitioners together, accounts for nearly 59 per cent of primary diabetes care, despite the availability of public facilities and the Aarogyasri scheme.

Across the strata, among male respondents, 33.85 per cent primarily use private hospitals, while 26.04 per cent rely on government hospitals or PHCs and 23.96 per cent depend on private clinics. About 9.38 per cent access charitable hospitals and 6.77 per cent report mixed sources of care. In the case of female respondents, a notably higher 38.46 per cent primarily use private hospitals, while 23.93 per cent rely on government facilities and 22.22 per cent depend on private clinics. About 8.55 per cent access charitable hospitals and 6.84 per cent report mixed sources of care. The comparison reveals that female patients are more concentrated in private hospital care relative to male patients, who show a marginally higher preference for public sector facilities.

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The findings indicate that the dominant role of the private health-care sector in chronic Type 2 diabetes management in Vijayawada has direct implications for out-of-pocket expenditure, since private care typically generates higher recurring costs than public alternatives, particularly for routine outpatient management that is inadequately covered under existing public insurance schemes.

Table – 5
Distribution of the Patients by Type of Healthcare Facility Primarily Used

Gender	Govt Hospital / PHC	Private Hospital	Private Clinic	Charitable Trust	Mixed Sources	Total
Male	50 (26.04)	65 (33.85)	46 (23.96)	18 (9.38)	13 (6.77)	192 (100.00)
Female	28 (23.93)	45 (38.46)	26 (22.22)	10 (8.55)	8 (6.84)	117 (100.00)
Total	78 (25.24)	110 (35.60)	72 (23.30)	28 (9.06)	21 (6.80)	309 (100.00)

Note: Figures in the parenthesis represent row percentages.
Source: Computed from the Primary Data.

Monthly Out-of-Pocket Expenditure on Diabetes Care

Table – 6 presents the distribution of patients by average monthly out-of-pocket expenditure on Type 2 diabetes care, encompassing medications, consultations, laboratory investigations and self-monitoring supplies. Of the sample surveyed, 29.77 per cent of the patients report monthly out-of-pocket expenditure in the Rs. 2,501 to Rs. 5,000 range, while 27.83 per cent report Rs. 1,001 to Rs. 2,500 and 18.12 per cent report Rs. 5,001 to Rs. 10,000. About 13.59 per cent report monthly expenditure of less than Rs. 1,000 and 10.68 per cent report expenditure exceeding Rs. 10,000 per month. This indicates that nearly three out of every ten patients spend in excess of Rs. 5,000 per month on Type 2 diabetes care alone, representing a substantial recurring claim on household resources.

Among male respondents, 30.21 per cent report monthly out-of-pocket expenditure in the Rs. 2,501 to Rs. 5,000 range, while 29.17 per cent report Rs. 1,001 to Rs. 2,500 and 16.67 per cent report Rs. 5,001 to Rs. 10,000. About 14.58 per cent report less than Rs. 1,000 per month and 9.37 per cent report expenditure exceeding Rs. 10,000. In the case of female respondents, 29.06 per cent report monthly expenditure in the Rs. 2,501 to Rs. 5,000 range, while 25.64 per cent report Rs. 1,001 to Rs. 2,500 and a notably higher 20.51 per cent report Rs. 5,001 to Rs. 10,000. About 12.82 per cent report expenditure exceeding Rs. 10,000 per month and 11.97 per cent report less than Rs. 1,000. A comparison between the two groups reveals that female patients are more concentrated in the higher expenditure brackets, with a combined 33.33 per cent reporting monthly out-of-pocket spending of more than Rs. 5,000, compared with 26.04 per cent among male patients.

The findings reveal that Type 2 diabetes imposes a substantial and recurring out-of-pocket burden on patients in Vijayawada, with female patients bearing comparatively higher expenditure consistent with their greater reliance on private hospital care and their concentration in slightly older age and longer-disease-duration brackets.

Table – 6
Distribution of the Patients by Monthly Out-of-Pocket Expenditure on Diabetes Care (in Rs.)

Gender	< 1,000	1,001–2,500	2,501–5,000	5,001–10,000	> 10,000	Total
Male	28 (14.58)	56 (29.17)	58 (30.21)	32 (16.67)	18 (9.37)	192 (100.00)
Female	14 (11.97)	30 (25.64)	34 (29.06)	24 (20.51)	15 (12.82)	117 (100.00)
Total	42 (13.59)	86 (27.83)	92 (29.77)	56 (18.12)	33 (10.68)	309 (100.00)

Note: Figures in the parenthesis represent row percentages.
Source: Computed from the Primary Data.

CONCLUSION

The findings reveal that the Type 2 diabetes patient population in Vijayawada is predominantly middle-aged, with the median age computed at approximately 48 years and the bulk of the sample concentrated in the 36 to 55 years productive age band. No respondents below 30 years of age were captured and only a small fraction (1.62 per cent) fell within the 30 to 35 years range, consistent with the well-established mid-life onset profile of Type 2 diabetes in urban India. Female patients are marginally more concentrated in the 46 to 65 years range, while male patients are more concentrated in the younger 36 to 45 years band. This indicates that gender intersects with disease age structure in ways that have direct implications for long-term expenditure trajectories.

Regarding household income, the majority of the patient sample belongs to the lower-middle and middle income brackets, with approximately 60 per cent reporting monthly household income between Rs. 15,001 and Rs. 50,000. Female patients are disproportionately concentrated in the lower income brackets relative to male patients, indicating that the relative affordability burden of diabetes care is unequally distributed across gender. The evidence indicates that chronic diabetes management in Vijayawada predominantly affects households of modest economic standing for whom recurring out-of-pocket expenditure represents a non-trivial share of monthly resources.

In terms of educational status, the patient sample reflects a moderately educated urban population, with the majority concentrated in the school-completed to graduate band. The

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educational distribution is broadly similar across gender, though female patients are marginally more represented at the lower end of the educational ladder. This pattern suggests important implications for the design of health literacy interventions, treatment adherence support and patient education programmes that are appropriately calibrated to the cognitive and informational profile of the target population.

The study further indicates that the disease duration profile spans the full chronic-illness trajectory, with more than half of the patients managing diabetes for at least five years and approximately one in four for more than ten years. This implies substantial cumulative exposure to diabetes-related expenditure across the sample, with consequent implications for complication risks, treatment intensification and long-term household financial planning. The pattern is broadly comparable across gender, with female patients marginally more represented in the longer-duration brackets.

With respect to the type of healthcare facility primarily used, the private health-care sector — comprising private hospitals and individual practitioners — emerges as the dominant source of Type 2 diabetes care, collectively accounting for nearly 59 per cent of primary care utilisation. Female patients show notably higher concentration in private hospital care relative to male patients. This indicates that despite the existence of government health facilities and the Aarogyasri scheme, a substantial majority of patients rely on private care for routine outpatient management, which has direct cost implications given the inadequate coverage of recurring outpatient expenditure under existing public insurance arrangements.

Finally, the out-of-pocket expenditure profile shows that Type 2 diabetes imposes a substantial and recurring financial burden on patients in Vijayawada, with monthly expenditure clustering in the Rs. 2,501 to Rs. 5,000 range and nearly three in ten patients spending in excess of Rs. 5,000 per month. Female patients bear comparatively higher expenditure, with one-third reporting monthly out-of-pocket spending of more than Rs. 5,000, compared with approximately one-fourth among male patients. Overall, the study concludes that socioeconomic characteristics — particularly age, household income and choice of provider — meaningfully shape the magnitude of diabetes-related out-of-pocket expenditure in urban Vijayawada, with gender exerting a consistent moderating influence that channels female patients toward higher private care utilisation and higher cost burdens. The findings underscore that recurring outpatient expenditure on chronic Type 2 diabetes management remains an inadequately addressed dimension of household health financing in tier-2 urban India.

It is suggested that the coverage of public health insurance schemes such as Dr. YSR Aarogyasri be selectively expanded to incorporate recurring outpatient costs of chronic diseases including Type 2 diabetes, particularly for low- and lower-middle-income households. The availability and continuity of essential diabetes medications and supplies through Jan Aushadhi outlets, government pharmacies and primary health centres may be strengthened to reduce dependence on private retail pharmacies. Gender-sensitive outreach is required to address the disproportionate reliance of female patients on private hospital care and their consequently higher out-of-pocket burden, including dedicated chronic disease screening and counselling services at the primary care level. Patient education and health literacy programmes may be designed in culturally appropriate formats accessible to patients across the educational spectrum, with particular attention to long-duration patients facing complication risk. Finally, future research may extend the present analysis through longitudinal designs tracking household expenditure trajectories, comparative studies across tier-2, tier-3 and metropolitan cities and integrated examinations of how multimorbidity, complication burden and informal caregiving costs interact to shape the total economic burden of Type 2 diabetes on Indian households.

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