

DISSERTATION TRAINING

AT

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH,

NEW DELHI

(8TH MARCH 2025- 7TH JUNE 2025)

A PROJECT REPORT ON

**Household expenditure on diabetes care among patients with
voluntary funded health insurance coverage in India-**

A Systematic Review.

By- Dr. JASLINE JENA

PG/23/041

UNDER THE GUIDANCE OF

DR. ARCHANA THAKUR

(ASSOCIATE PROFESSOR, IIHMR DELHI)

PGDM (HOSPITAL AND HEALTH MANAGEMENT)

(2023-2025)



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International Institute of Health Management Research, New Delhi

(Completion of Dissertation from IIHMR, DELHI)

The certificate is awarded to

Dr. Jasline Jena

in recognition of having successfully completed her internship at

IIHMR, DELHI

and has successfully completed her Project on

**Household expenditure on diabetes care among patients with voluntary
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A Systematic Review.

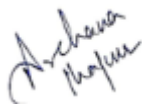
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She comes across as a committed, sincere & diligent person

who has a strong drive & zeal for learning.

We wish her all the best for future endeavors.



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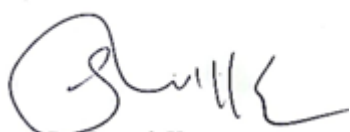
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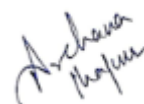
This is to certify that **Dr. Jasline Jena** student of PGDM (Hospital & Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at **IIHMR, NEW DELHI** from **8TH MARCH 2025-7TH JUNE 2025**.

The Candidate has successfully carried out the study designated to him during internship training and his/her approach to the study has been sincere, scientific and analytical. The Internship is in fulfilment of the course requirements.

I wish her all success in all his/her future endeavours.



Dr. Sumesh Kumar
Associate Dean, Academic and Student Affairs
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IIHMR, New Delhi

Certificate of Approval

The following dissertation titled **Household expenditure on diabetes care among patients with voluntary funded health insurance coverage in India- a Systematic Review**.at **IIHMR Delhi** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

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Certificate from Dissertation Advisory Committee

This is to certify that **Dr. Jasline Jena**, a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. She is submitting this dissertation titled “**Household expenditure on diabetes care among patients with voluntary funded health insurance coverage in India-A Systematic Review.**” at “**IIHMR, DELHI**” in partial fulfilment of the requirements for the award of the **PGDM (Hospital & Health Management)**.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.



DR. ARCHANA THAKUR
(ASSOCIATE PROFESSOR)

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This is to certify that the dissertation titled **Household expenditure on diabetes care among patients with voluntary funded health insurance coverage in India- a systematic review** and submitted by **Dr. JASLINE JENA**, Enrolment No. **PG/23/041**, under the supervision of **Dr. Archana Thakur, Associate Professor, IIHMR, DELHI**, for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from **8TH MARCH 2025 to 7TH JUNE 2025**, embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

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FEEDBACK FORM

Name of the Student: Dr. Jasline Jena

Name of the Organisation in Which Dissertation Has Been Completed: IIHMR, DELHI

Area of Dissertation: Household expenditure on diabetes care among patients with voluntary funded health insurance coverage in India- a Systematic Review.

Attendance: 8TH MARCH 2025- 7TH JUNE 2025

Objectives achieved: Systematically reviewed existing literature on household expenditure on diabetes care among patients with voluntary funded health insurance coverage in India, the out of pocket medical and medicals costs along with the indirect costs.

Deliverables- Comprehensive review along with data instruction to reach at deductive conclusion to recommend policy modifications to reduce distress financing among diabetic individuals with voluntary funded health insurance coverage in India.

Strengths:

strong communication skills
interpersonal skills.

Suggestions for Improvement: Need to focus

More on detailing rather than just completion

Suggestions for Institute (course curriculum, industry interaction, placement, alumni):

focus more towards teaching practical skills.
relevant to current industry needs.

Acharya
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Title of the Dissertation	Household expenditure on diabetes care among patients with voluntary funded health insurance coverage in India- a Systematic Review		
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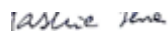
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ABSTRACT

TITLE- Household expenditure on diabetes care among patients with voluntary funded health insurance coverage in India- a Systematic Review.

Diabetes mellitus imposes a significant economic burden on individuals and households in India, particularly due to long-term treatment and complications associated with the disease. While voluntary funded health insurance schemes aim to offer financial protection against health-related expenses, their effectiveness in reducing out-of-pocket expenditure (OOPE) for chronic diseases like diabetes remains unclear. This systematic review aims to examine the patterns and determinants of household expenditure on diabetes care among individuals enrolled in voluntary health insurance schemes in India.

Objective- To estimate the mean annual household expenditure among diabetic patients with voluntary funded health insurance coverage in India.

Methodology- Search Strategy and Selection Criteria

The research papers were searched from the following three databases- PubMed (511), Cochrane, Central Register of Controlled Trials (CENTRAL), Cochrane Register of Studies Online (387) and ProQuest (168). Studies published between 2018 and 2025 were included. Inclusion criteria encompassed observational studies, cross-sectional analyses, and economic evaluations that reported household-level diabetes care expenditure among individuals with voluntary health insurance coverage in India. The review followed the PRISMA guidelines. Data was extracted and synthesized on total health expenditure, OOPE, insurance coverage benefits, and cost drivers, with particular focus on direct medical and non-medical expenses.

Results- Out of 1032 studies screened, zero studies were found which contained data on out-of-pocket expenditure in diabetes patients with Voluntary funded health insurance in India.

Conclusion- Voluntary funded health insurance schemes in India provide limited financial risk protection for households managing diabetes. Most schemes do not fully cover outpatient and drug-related costs, resulting in continued economic strain on insured patients. Enhancing policy design to include comprehensive outpatient benefits, increasing awareness, and ensuring better integration with diabetes management protocols could significantly reduce household expenditure. Future research should explore the cost-effectiveness and equity implications of expanding benefit packages for chronic disease care under voluntary insurance models in India.

Acknowledgement

With utmost gratefulness I would like to thank my institute – **IIHMR, DELHI** for providing me this enriching platform to wherein I could learn and grow throughout my dissertation journey.

I would like to express my gratitude to my mentor – **Dr. Archana Thakur, Associate Professor, IIHMR, DELHI** for her unwavering support during my internship, for guiding me through every step and enlightening me with lifelong learning experience.

I am deeply honoured to have learnt the essential research skills and protocols throughout my journey which will help me in my future endeavours.

I extend my sincere thanks to **Dr. Sumesh Kumar**, Associate Dean, Academic and Student Affairs, IIHMR, New Delhi, for his academic support and encouragement.

My gratitude also goes to the Dissertation Advisory Committee for their constructive suggestions and approval of this work.

Regards,

Dr. Jasline Jena

TABLE OF CONTENTS

Serial No.	Contents
1	Abstract
2	Acknowledgement
3	Table of Contents
4	Introduction
5	Review of Literature
6	Methodology
7	Data Screening tables
8	Results
9	Discussion
10	Limitations of the Study
11	Conclusion
12	Bibliography
13	Plagiarism Report

INTRODUCTION

Diabetes mellitus is a global public health concern. Globally, 537 million adults have diabetes and is expected to rise to 783 million by year 2045[1]. In India, estimated 74 million people are suffering from diabetes with one in every 13 individuals is having diabetes [2]. Prevalence of diabetes in India varies across states which is as high as 20% in Kerala [3]. Furthermore, 25 million people are prediabetic and at risk of having diabetes in near future underscoring the public health crisis in India [4].

Urbanization, genetic predisposition combined with lifestyle changes including lack of physical inactivity, unhealthy diet, indulging in harmful behaviours such as smoking and alcoholism contribute to this rapid rise.

Diabetes is an expensive disease as it needs lifelong and sophisticated medical care. Complication related to diabetes further increase the healthcare cost of diabetes care. In health care settings with no health insurance and other prepayment mechanism, the cost of diabetes care is borne out of pocket by households. Out of pocket expenses is a regressive form of health financing poses an economic burden on poor households, sometimes leading to catastrophic expenditure and impoverishment.

Out-of-pocket due to diabetes care ranging from INR 5000 to INR 30,000 per month highlighting the inaccessibility to affordable healthcare services to diabetes.[5]

Access to healthcare services is integral to achieve sustainable development goal.

India has launched Ayushman Bharat scheme, a tax financed public health insurance to provide essential healthcare services with optimum quality and at affordable price.

Ayushman Bharat scheme aims to provide comprehensive preventive, curative and

rehabilitative services to all including people with diabetes through health and wellness centre. The scheme also aims to reduce financial risk due to hospitalisation and treatment of diabetes related complications under PM-JAY. The scheme covers poorest 40% of Indian population. Rest of the population has only choice to buy voluntary health insurance after paying hefty premium. The voluntary health insurance policies cover people with diabetes only after waiting period of 2-3 years. To get coverage from critical illness such as end stage renal failure and heart failure, they need to buy riders after paying additional amount. These policies offer a variety of additional benefits, such as coverage for AYUSH treatments (Ayurveda, Unani, Siddha, and Homeopathy), no-claim bonuses, tax breaks under Section 80D, portability options, restoration benefits, ambulance services, advanced diagnostic tests, domiciliary treatment, and regular health check-ups. These benefits ensure that diabetics receive comprehensive support for managing diabetes and its complications and is hypothetically expected to reduce burden of healthcare cost in these households. However, clear evidence supporting the hypothesis is lacking. We planned a systematic review to gather evidence on household expenditure on diabetes care for patients with voluntary health insurance policies. Household expenses will include direct medical and non-medical as well as indirect costs due to loss of income from productivity losses. This study will provide estimates of household expenditure to understand economic burden among insured person and highlight the need of further innovations in health insurance policies both by innovators and at policy levels. [6]

However, clear evidence supporting the hypothesis is lacking.

Review of Literature

The Indian diabetic population is predicted to reach more than 80 million by the year 2030. It indicates that immediate health policy restructuring and investment will be needed if the best use is to be made of scarce health care resources with accompanying economic constraints.

The direct costs are related to the medical and non-medical cost of people with diabetes, mostly the burden on individual and at the family level. The indirect costs are related to the society and government, which are associated to loss of productivity.

Three studies were included for Review of Literature- Author name, Year of study, Study design, study objective, study findings etc were reviewed.

- Economic burden of diabetic patients in India: A review by Balasaheb Bansode et al. - This is a systematic review conducted in 2019 with a study objective to determine the economic burden of diabetic patients in India. A total of 18 studies were included in the review with the relevant findings being, total annual expenditure on diabetes on an average was INR 10000 in Urban areas and INR 6260 in Rural areas. The review reveals that it is imperative to work effectively towards implementing a holistic programme for diabetes prevention and reduce diabetic expenditure burden in the community.

- **Economic Burden of Cardiovascular Disease in Type 2 Diabetes: A Systematic Review** by Einarson T et al.- This is a systematic review conducted in 2018 with a study objective to review published articles describing costs of Cardiovascular diseases in Type 2 Diabetes Mellitus. A total of 24 studies were reviewed with relevant findings being \$9750 for treatment of CVD and Type 2 Diabetes Mellitus, cost of treatment of Type 2 DM alone was \$3418.
- **Cost of Diabetic care in India: An inequitable picture** by Tripathy J et al.- Secondary analysis of Nationally representative data conducted in 2018 with a study objective to estimate household OOPe for hospitalization in Diabetes Mellitus, 3935 episodes of hospitalization were included in the study with relevant findings of OOPe for DM hospitalization –USD 151.

Conclusion- The studies related to diabetes indicate that the direct and indirect cost implications of diabetes are multifold worldwide. The direct costs are related to the medical and non-medical cost of people with diabetes, mostly the burden on individual and at the family level. The indirect costs are related to the society and government, which are associated to loss of productivity. The review also finds that the annual direct and indirect medical costs per patient increase with the number of microvascular and macrovascular complications.

METHODOLOGY

Operational Definitions-

- **Out-of-Pocket Expenditure-** out-of-pocket expenditure” (OOPE) on health care generally refers to the direct payments made by households at the point of service—net of any reimbursements—for medical goods and services, without support from insurance or government funding.
- **Catastrophic Health Expenditure-** Catastrophic health spending is defined as out-of-pocket spending exceeding 10% of total household consumption or income by the budget share approach, as well as out-of-pocket spending exceeding 40% of non-food consumption.

(Source: International Journal for Equity in Health)
- **Voluntary funded health insurance** under **IRDAI** refers to commercial health insurance schemes that individuals or employers purchase on their own initiative, as opposed to being automatically enrolled in government-sponsored or mandatory social schemes.

Research Question

What is the average out of pocket expenditure by patients with diabetes possessing voluntary funded health insurance coverage in India?

Population:	Households seeking care for diabetes patients insured with voluntary funded health insurance scheme in India
Intervention	not applicable
Comparator	not applicable
Outcome	Mean annual household expenditure on diabetes care

Research Design

Objectives of the Study-

We planned a systematic review to gather evidence on annual expenditure on diabetes care among households with voluntary health insurance policies. Household expenses will include direct medical and non-medical as well as indirect costs due to loss of income from productivity losses. This study will provide estimates of household expenditure to understand economic burden among insured person and highlight the need of further innovations in health insurance policies both by innovators and at policy levels.

SEARCH STRATEGY

The research papers were searched from the following three databases- **PubMed** (511), **Cochrane**, Central Register of Controlled Trials (CENTRAL), Cochrane Register of Studies Online (387) and **ProQuest** (168). Studies published between 2018 and 2025 were included.

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Table:1

CONCEPT	SEARCH STATEMENT	RESULTS
Diabetic patients.	Diabet*[Tw]	9,25,286
In India	India [Tw]	2,03,360
Out of Pocket Expenditure.	Cost [TiAb] OR Expenditure [TiAb] OR OOPE[TiAb] OR Econom*[TiAb] OR Finance*[TiAb] OR Out of Pocket [TiAb]	1,100,939
Out of pocket Expenditure in diabetic patients in India.	Cost [TiAb] OR Expenditure [TiAb] OR OOPE[TiAb] OR Econom*[TiAb] OR Finance*[TiAb] OR Out of Pocket [TiAb] AND India [Tw] AND Diabet*[Tw]	952
Out of pocket Expenditure in diabetic patients in India from the year 2018-2025.	Diabet*[Tw] AND India [Tw] AND Cost [TiAb] OR Expenditure [TiAb] OR OOPE[TiAb] OR Econom*[TiAb] OR Finance*[TiAb] OR Out of Pocket [TiAb]	510

Concept	Search Statement
India	(India):ti ,ab,kw
Diabetes	(diabetes OR niddm OR mody): ti, ab, kw
Cost	(cost*OR expenditure* OR econom*) ti,ab,kw

Search Strategy in Cochrane Library- Total Results 129

Table-2

Selection Criteria

Studies were selected based on the Inclusion criteria within a time frame of 2018-2025, in order to ensure relevance to contemporary healthcare financing and policy contexts. Out of pocket expenditure data among the insured individuals possessing voluntary funded health insurance (not any government funded health scheme) was captured. OOPE involved the direct and indirect medical costs for diabetes care, medical expenses included doctor consultations, tests, prescription drugs, and treatments, non-medical expenses included lodging, meals, and transportation. Indirect costs involved loss of wages and productivity due to illness or psychosocial factor and loss of wages of attendants. The costs were captured in perspective of different geographical regions, socioeconomic backgrounds, education levels and history of co-morbidities. Studies conducted in both hospital-based and community-based settings were included. **Inclusion Criteria-** We focussed on studies estimating household expenditure/out-of-pocket expenditure/loss of wages due to illness or care-seeking for diabetes, with voluntary health insurance coverages in India. All observational studies or RCTs from community or hospital-based sources.

Only Type 2 DM studies, included. **Exclusion Criteria-** Non-English language studies, Case reports, case series, editorials, letter to editor, conference presentations, reviews, viewpoint, other forms of diabetes – type 1, GDM, or other conditions leading to hyperglycaemia not included.

Screening

The screening process followed a two-phase approach. First, titles and abstracts (TiAb) of retrieved records were screened using Microsoft Excel. In the second phase, full texts of shortlisted studies were evaluated against predefined inclusion/exclusion criteria. Studies that met the criteria were selected for final inclusion. This dual screening process minimized bias and enhanced the reliability of the study selection. Selection of relevant studies based on title and abstract followed by full text review. Final selection of the studies was included in the review done by considering the inclusion and exclusion criteria. Title and Abstract screening of studies obtained from search results in the databases was conducted. PubMed-52, Cochrane-3, ProQuest-33.

Data Extraction

Data Extraction was performed using a designated template in Microsoft Excel.

The variables included in data extraction sheet prepared on excel will be Author, Year of Publication, Country, Study Setting, Study type, Age group, Cost of Complications, Inclusion Criteria, Exclusion Criteria, Sample Size, Diabetes Care Utilization, Type of Facility, Treatments with Higher Costs, Indirect Costs Proportion of household expenditure spent on Diabetes Information on Insurance, Mean Out of Pocket Expenditure, Catastrophic Health Expenditure.

Table:3(a) -Study Variables in the Data Extraction Sheet

Study Characteristics
Author(s), Year of Publication, Place
Study Design, Study Setting
Study Population
Sample Size
Year of cost estimation
Outcome of Study
Inclusion and Exclusion Criteria
Basis of Assessment
Study Limitation

Table:3(b)- Diabetes and insurance specific variables

Type of Diabetes and Duration of diabetes
Diabetes care utilization
Insurance Status and Type of Insurance
Diabetes with Co-morbidities
Diabetes with Complications
Age group, Gender, Age of patients
Socioeconomic status and the scale to measure it
Education level of patients-to determine awareness about diabetes care

Table:3(c) – Expenditure specific variables

Overall Out of pocket expenditure
Direct Medical costs- Consultation, Investigation, Medicines
Non-Medical costs-Room rent, transport, diet
Indirect costs
OOPE among diabetic patients with one or more Co-morbidities
OOPE among diabetic patients with one or more complications
OOPE among insured individuals
Proportion of household expenditure spent on diabetes care

Quality Appraisal

We used “consensus-based checklist for the critical appraisal of cost-of-illness (COI) studies” for Quality Appraisal.

Reporting

We used PRISMA 2020 for reporting. PRISMA 2020 flow diagram is a visual tool used in systematic reviews to transparently report the flow of information through different phases of the review process, including the identification, screening, and inclusion/exclusion of studies. It maps out the number of records identified, included, and excluded, along with the reasons for exclusions.

RESULTS

A total of 1032 records were identified through the database search. After removing duplicates, about 136 records, Records excluded -956, records not retrieved- 6 and screening titles and abstracts, 76 full-text articles were assessed for eligibility, records assessed for eligibility-20. Reports excluded-study did not involve OOPE- (36), study involved Type1 DM (3), the study was conducted before 2018(13).

Amongst the 20 studies included in the eligibility of records, none of the studies fully met the inclusion criteria However, none met the predefined inclusion criteria.

Therefore, no studies were included in the final review.

The results of a systematic review with zero included studies is sometimes called a *“empty review”* however it is a recognized scenario in evidence synthesis.

No studies met the inclusion criteria completely, however there **were 4 such studies which contained data on Insurance status and type of insurance possessed but no data about Out-of-pocket expenditure (OOPE) among insured individuals and Proportion of household expenditure spent on diabetes care.**

Study Characteristics (Table-3a)

Several Indian states were involved in the review like-Chennai, Delhi, Odisha, Punjab, Gujarat, Jaipur, Mangalore, Puducherry etc. Basis of Assessment – primary data collected through self-structured interviews by means of questionnaires in most of the studies.

Study design and setting

Predominantly Cross-sectional studies (14 studies). Sample sizes varied from 153(Mathew G et al;2019; Bengaluru) to 912(Pati S et al;2022; Odisha).

Diabetes Status

Type 2 Diabetes Mellitus cases included in the study who were seeking medical treatment from both public and private healthcare centres. Diabetes care included drug therapy, surgeries for diabetic foot ulcer, other alternative treatments etc.

In one of the studies, it was found that in 72.4% cases health-seeking behaviour for diabetes was self-initiated, when they first experienced the symptoms and were subsequently diagnosed.

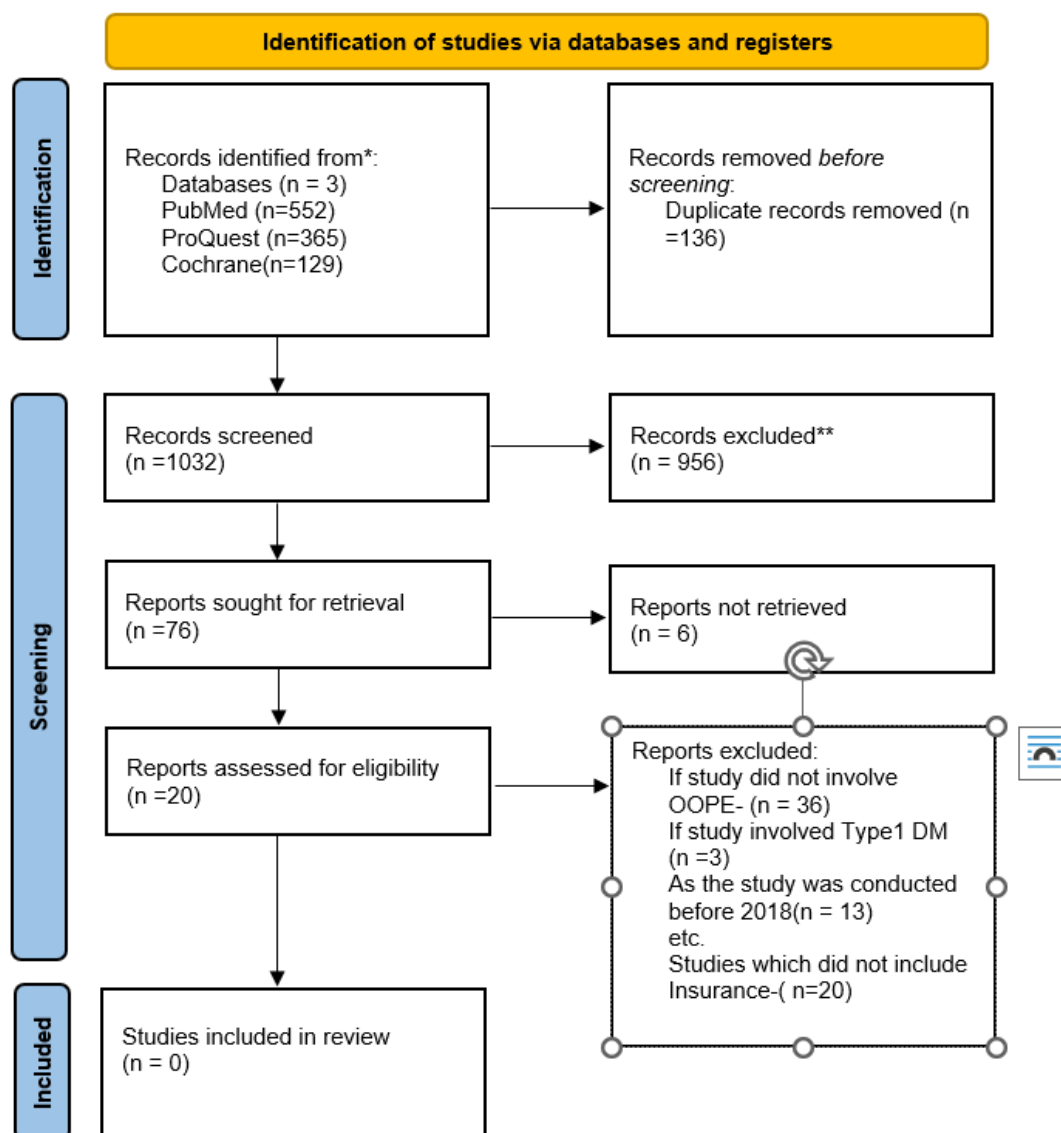
Insurance specific studies

There were 4 studies which included insurance status of the patients-

Mathew G et al;2019; Bengaluru, Seshadri H et al; Chennai;2024, Basu S et al;2020; DELHI, Sharma A et al;2021; Punjab.

However, there was no data on Out-of-pocket expenditure among the insured diabetic patients.

The PRISMA 2020 Flow Diagram for this systematic review is as follows-



AUTHOR, YEAR,PLACE	Insurance status	Type of Insurance	OOPE among insured	Proportion of household expenditure spent on diabetes care
Basu S et al;2020;DELHI	29 PATIENTS INSURED	Unspecified but with complete medication coverage	UNSPECIFIED	UNSPECIFIED
Seshadri H et al;Chennai;2024	Insured:67.5%	state government insurance programme.	UNSPECIFIED	UNSPECIFIED
Sharma A et al;2021;Punjab	20% insured	17% with personal HI and 3% with employer provided insurance	UNSPECIFIED	UNSPECIFIED
Mathew G et al;2019;Bengaluru	insured;6.5%	unspecified	UNSPECIFIED	UNSPECIFIED

Table:4- Studies captured with data on Insurance

Due to the lack of eligible studies, a quantitative or qualitative synthesis could not be conducted.

Out of 76 full text reviews- 20 studies involved Out of pocket expenditure data with or without insurance coverage among individuals.

The studies not included in the review were marked with reasons for rejection, mostly when they did not meet the inclusion criteria.

Discussion

We did not find any eligible study to support our research question.

Future studies should be conducted in this area to find evidence regarding the economic burden on Indian households due to Diabetes Care among patients having Voluntary funded health insurance schemes or provide sub group analysis by insurance status (different types of insurance).

While several studies have explored the out-of-pocket expenditure (OOPE) associated with diabetes care in general populations, there remains a lack of focused evidence examining how different types of health insurance—particularly voluntary, privately purchased schemes—affect this financial burden. Such insurance schemes, which are regulated by the Insurance Regulatory and Development Authority of India (IRDAI), are increasingly being adopted by individuals seeking financial protection against rising healthcare costs. However, their actual impact on reducing household expenditure for chronic conditions like diabetes remains poorly understood.

There is a strong need for future research to assess the economic implications of diabetes care within the context of insurance coverage. Studies should aim to provide a sub-group analysis based on insurance status, comparing OOPE and other financial metrics across different types of insurance—such as voluntary funded health insurance, employer-sponsored insurance, government-funded schemes, and uninsured populations. Such comparisons could reveal whether and how voluntary insurance offers meaningful financial protection for households managing long-term, high-cost conditions like diabetes.

Moreover, future research should also consider regional disparities, treatment modalities, access to medications, and the role of insurance in covering essential services such as diagnostics and preventive care. A more nuanced understanding of these dynamics can inform policy efforts to design equitable and effective health insurance mechanisms that truly alleviate the economic burden on Indian households.

Limitation of the study

We did not find any relevant studies which could be eligible to be included in this review.

Despite conducting a comprehensive and systematic search across multiple databases, none of the retrieved literature provided sufficient methodological rigor, appropriate study design, or directly addressed our specific research question. This absence of eligible studies underscores a significant gap in the current body of evidence and highlights the need for focused research in this area.

Conclusion

The study revealed that there is no evidence of economic burden on Indian households with voluntary funded health insurance due to Type 2 Diabetes care.

There is a definite need to design and conduct studies to evaluate the effectiveness of the Voluntary funded health insurance in reducing the financial burden on the Indian population and ensure financial risk protection. This review revealed a critical gap in the existing literature, with no available evidence specifically addressing the economic burden experienced by Indian households with voluntary funded health insurance in the context of Type 2 Diabetes care. Despite the increasing prevalence of diabetes and the expanding coverage of voluntary health insurance schemes in India, there is a lack of empirical data to assess whether such insurance mechanisms effectively reduce the financial burden associated with diabetes management.

Given the chronic nature of Type 2 Diabetes and its long-term cost implications for individuals and families, it is imperative to design and conduct rigorous studies that evaluate the role of voluntary funded health insurance in providing financial risk protection. Future research should focus on quantifying out-of-pocket expenditures, evaluating coverage adequacy, and identifying disparities in financial protection across different insurance types and socioeconomic groups. Such evidence is essential to inform policy decisions aimed at strengthening the health financing system and ensuring equitable access to affordable diabetes care for all segments of the population

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