

Effectiveness of cme (Continuing Medical Education) Programs in Influencing Prescription Behaviour of Doctors in Vadodara

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Abstract—Continuing Medical Education (Cme) Programs Play A Crucial Role In Enhancing The Knowledge, Clinical Competence, And Professional Development Of Healthcare Practitioners. In A Rapidly Evolving Pharmaceutical And Medical Landscape, Cme Serves As An Essential Tool For Updating Physicians About New Treatment Guidelines, Drug Therapies, And Evidence-Based Practices. This Study Aims To Evaluate The Effectiveness Of Cme Programs In Influencing The Prescription Behaviour Of Doctors In Vadodara.

The Research Focuses On Understanding Whether Cme Programs Genuinely Contribute To Rational Prescribing Practices Or Whether They Are Influenced By Pharmaceutical Sponsorship And Promotional Intent. A Descriptive And Quantitative Research Design Was Adopted, And Primary Data Were Collected Through Structured Questionnaires From Practicing Doctors In Vadodara.

The Study Examines Factors Such As Knowledge Enhancement, Prescribing Confidence, Influence Of Pharmaceutical Companies, And Changes In Prescription Patterns Post-Cme Participation. The Findings Indicate That Cme Programs Positively Impact Clinical Knowledge And Decision-Making; However, There Exists A Moderate Influence Of Promotional Bias In Certain Cases. The Study Highlights The Importance Of Maintaining Transparency, Ethical Standards, And Unbiased Content In Cme Programs To Ensure Improved Patient Outcomes And Rational Drug Use.

Index Terms—Cme Programs, Prescription Behaviour, Doctors, Pharmaceutical Marketing, Rational Prescribing, Vadodara

I. INTRODUCTION

The Healthcare Industry Is Continuously Evolving With Advancements In Medical Science, Drug Development, And Treatment Protocols. In Such A Dynamic Environment, It Becomes Essential For

Healthcare Professionals, Especially Doctors, To Stay Updated With The Latest Clinical Knowledge And Practices. Continuing Medical Education (Cme) Programs Are Structured Educational Initiatives Designed To Support Lifelong Learning Among Medical Practitioners.

Cme Programs Include Seminars, Workshops, Conferences, And Online Learning Modules That Aim To Enhance Physicians' Knowledge, Clinical Skills, And Professional Competence. In India, Regulatory Authorities Emphasize Cme Participation As Part Of Professional Development, Making It Increasingly Relevant In Urban Healthcare Hubs Like Vadodara.

Vadodara Is Recognized As An Important Pharmaceutical And Healthcare Center, With A Strong Presence Of Pharmaceutical Companies And A Diverse Network Of Healthcare Providers. This Makes It An Ideal Setting To Study The Impact Of Cme Programs On Doctors' Prescribing Behaviour.

While Cme Programs Are Primarily Educational, Many Are Sponsored By Pharmaceutical Companies. This Raises Concerns About Potential Bias And The Possibility Of Influencing Doctors' Prescription Decisions Toward Specific Brands. Therefore, It Is Important To Evaluate Whether Cme Programs Truly Promote Evidence-Based Prescribing Or Indirectly Support Marketing Objectives.

This Study Aims To Assess The Effectiveness Of Cme Programs In Influencing The Prescription Behaviour Of Doctors In Vadodara And To Understand The Balance Between Education And Promotion.

II. LITERATURE REVIEW

Previous Studies Highlight That Cme Programs Are Effective In Improving Physicians' Knowledge, Clinical Skills, And Adherence To Treatment Guidelines. Research Suggests That Interactive Cme Sessions, Case-Based Learning, And Repeated Exposure To Educational Content Are More Effective In Influencing Clinical Behaviour Compared To Traditional Lecture-Based Formats.

Studies Also Indicate That Cme Programs Contribute To Improved Patient Care Outcomes By Promoting Evidence-Based Practices And Rational Drug Use. Physicians Who Actively Participate In Cme Programs Are More Likely To Adopt Updated Treatment Protocols And Discontinue Outdated Practices.

However, Literature Also Points Out Concerns Regarding Pharmaceutical Sponsorship In Cme Activities. Sponsored Programs May Introduce Bias By Promoting Specific Drugs Or Brands, Which Can Influence Prescribing Behaviour. This Creates A Conflict Between Educational Objectives And Marketing Strategies.

Trust, Credibility Of Speakers, Quality Of Content, And Transparency In Disclosures Are Identified As Critical Factors Determining The Effectiveness Of Cme Programs. Additionally, Demographic Factors Such As Experience, Specialization, And Practice Setting Influence How Doctors Perceive And Apply Cme Knowledge.

Overall, Existing Literature Suggests That While Cme Programs Have Significant Educational Value, Their Effectiveness Depends On Content Quality, Delivery Methods, And Ethical Standards.

Problem Statement Of The Study:

Despite The Growing Importance Of Cme Programs In Medical Education, There Is Limited Clarity Regarding Their Actual Impact On Prescription Behaviour. While These Programs Aim To Enhance Clinical Knowledge And Promote Rational Prescribing, Concerns About Promotional Bias And Pharmaceutical Influence Persist.

Therefore, The Core Problem Addressed In This Study Is:

To Evaluate Whether Cme Programs Effectively Influence Doctors' Prescription Behaviour In A Rational And Evidence-Based Manner, Or Whether They Are Influenced By Promotional Activities In Vadodara.

Objectives Of The Study

- * To Analyse The Impact Of Cme Programs On Doctors' Knowledge And Clinical Decision-Making
- * To Evaluate The Influence Of Cme Participation On Prescription Behaviour
- * To Assess The Role Of Pharmaceutical Sponsorship In Cme Programs
- * To Examine Whether Cme Promotes Rational And Evidence-Based Prescribing
- * To Identify Factors Affecting The Effectiveness Of Cme Programs

Hypotheses

- H1: Cme Programs Have A Significant Positive Impact On Doctors' Prescription Behaviour
- H2: Cme Programs Improve Clinical Knowledge And Decision-Making Of Doctors
- H3: Pharmaceutical-Sponsored Cme Programs Influence Brand Preference In Prescriptions
- H4: Cme Programs Promote Rational Prescribing Practices
- H5: The Effectiveness Of Cme Programs Depends On Content Quality And Delivery Method

Research Methodology

The Study Adopts A Descriptive And Quantitative Research Design To Evaluate The Effectiveness Of Cme Programs.

Primary Data Were Collected Through A Structured Questionnaire Distributed Among Doctors Practicing In Vadodara. The Questionnaire Included Multiple Items Measured On A Likert Scale Ranging From Strongly Agree To Strongly Disagree.

A Convenience Sampling Method Was Used Due To Accessibility And Time Constraints. The Data Collected Were Analysed Using Statistical Tools To Identify Patterns And Relationships Between Cme Participation And Prescription Behaviour.

The Study Focused On Variables Such As Knowledge Enhancement, Prescribing Confidence, Influence Of Cme Content, And Impact Of Pharmaceutical Sponsorship.

III. RESEARCH DESIGN

Primary Research And Secondary Research:

Primary Research: Descriptive Survey Research Conducted Through A Structured Questionnaire Distributed To Doctors.

Secondary Research: Review Of Relevant Literature, Including Academic Journals, Articles, And Reports On Cme Programs, Prescription Behavior, And Pharmaceutical Marketing Strategies.

Source Of Data

They Can Be Grouped As:

i) Primary Source Of Data:

Data Was Collected Through Online Surveys (Google Forms) Targeting Doctors Practicing In Vadodara.

ii) Secondary Source Of Data:

Secondary Data Sources From Google Search, Google Scholar, Sci-Hub, Research Gate, Magazines, Newspapers Etc.

Data Collection Method

Data Was Gathered Using A Primary Survey Method Through A Structured Questionnaire Designed To Capture Doctors' Perceptions, Attitudes, And Behavioral Changes Related To Cme Participation.

Population

- Vadodara Has An Estimated 5,000 To 6,000 Registered Practicing Doctors, Including General Physicians, Specialists, And Academic Clinicians.
- This Diverse Medical Base Makes It A Strong Setting For Evaluating How Cme Programs Influence Prescription Behavior.
- The Study Population Consists Of 500 Qualified Doctors Practicing In Vadodara, Gujarat, India.
- These Include General Practitioners, Specialists, And Consultants.

Sampling Method:

- Probability Sampling Method – Simple Random Sampling.
- To Ensure Unbiased Representation Across Different Medical Specialties And Clinical Practice.

Sampling Frame

- The Sampling Frame Includes Registered Medical Practitioners In Vadodara And Urban Areas Practicing In Hospital And Private Clinics.
- Sample Size Consist Of 500 Registered Medical Practitioner Practicing In Hospital And Private Hospitals.

Data Collection Instrument

The Primary Instrument Used Was A Structured Questionnaire, Which Included:

- Five-Point Likert Scale Items To Measure Agreement Levels.
- Close-Ended Questions (Rating And Ranking Scales) To Assess Cme Participation And Prescription Behavior.
- One Open-Ended Question At The End To Capture Qualitative Insights And Suggestions From Respondents.

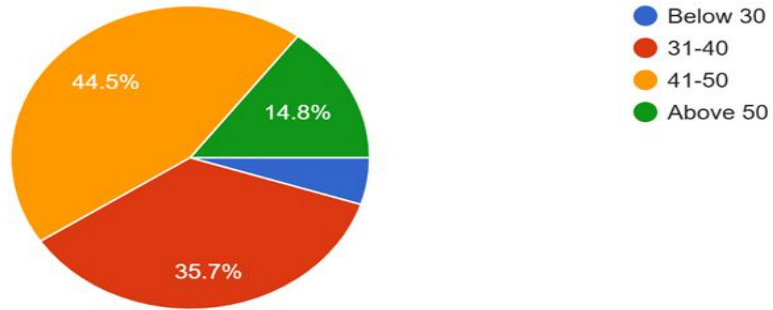
Data Analysis:

Table 1: Age

Awareness About Cme Programs Varies Among The Population With Age Differences, As Old Doctors Are Less Aware Then The Younger Age Group.

Description	Percentage
Below 30	5%
31 - 40	35.7%
41 - 50	44.5%
Above 50	14.8%

Age Group:
501 responses



Interpretation-

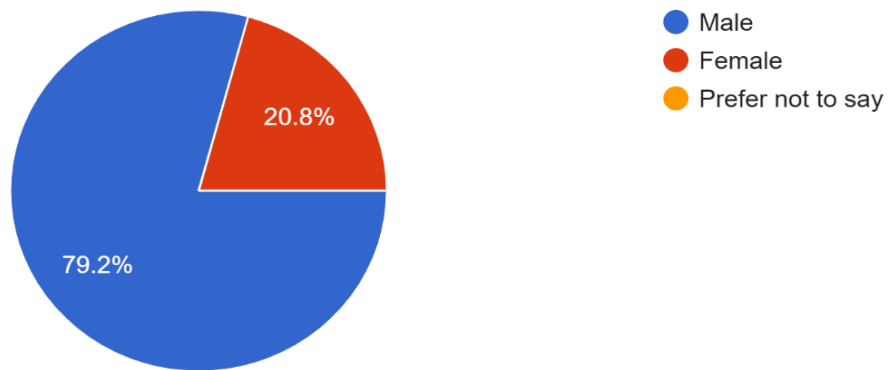
- 5% Of The Respondents Are Below The Age Group Of 30 Years.
- 35.7% Of The Respondents Are Between The Age Group Of 31-40 Years.
- 44.5% Of The Respondents Are Between The Age Group Of 41-50 Years.
- 14.8% Of The Respondents Are Above The Age

Group Of 50 Years.

Table 2: Gender Awareness About Cme Programs Varies Among The Population With Gender Differences

Description	Percentage
Male	79.2%
Female	20.8%
Prefer Not To Say	0%

Gender:
501 responses



Interpretation-

- 79.2% Of The Respondents Are Male Doctors.
- 20.8% Of The Respondents Are Female Doctors.

Qualification Of The Respondent Is Essential To Know How They Perceive The Green Products As Well As To Know The Level Of Understanding Regarding Green Products As A Consumer.

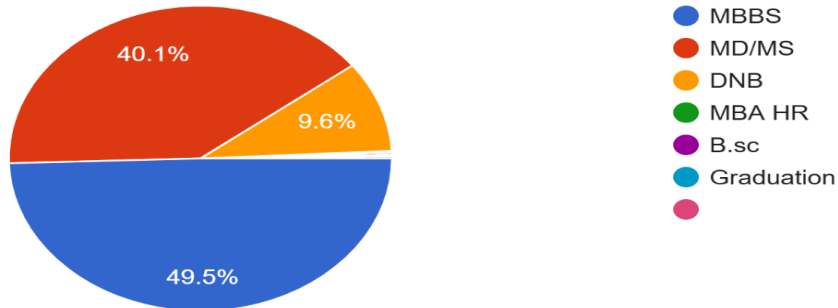
Table 3: Education Level- Qualification

The Level Of Qualification Can Differentiate The Criteria Of Looking At Importance Of Green Products. The Consumer Who Is Highly Qualified Expected To Have A Better Knowledge Of Green Products Than Low Qualified Consumer In The Market.

Description	Percentage
Mbbs	49.5%
Md/ Ms	40.1%
Dnb	9.6%

Qualification:

499 responses



Interpretation-

- 49.5% Of The Respondents Are Mbbs Doctors.
- 40.1% Of The Respondents Are Md/Ms Doctors.
- 9.6% Of The Respondents Are Dnb.
- 0.8% Of The Respondents Are Other Doctors.

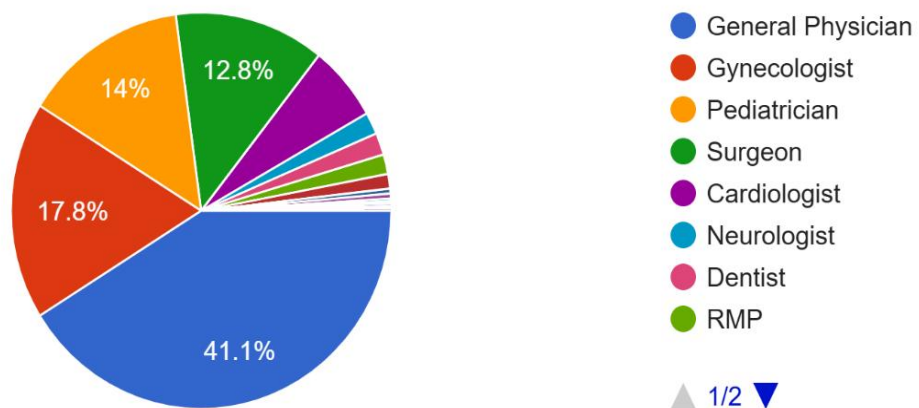
Description	Percentage
General Physician (Gp)	41.1%
Gynecologist	17.8%
Pediatrician	14%
Surgeon	12.8%
Cardiologist	5.3%
Neurologist	1.2%
Others	7.8%

Table 4: Area Of Specialization (Speciality)

Area Of Speciality Is Important To Understand The Responses Level Of Understanding On Effectiveness Of Cme Programs On Prescription Behavior Of Doctors

Area of specialization:

501 responses



Interpretation-

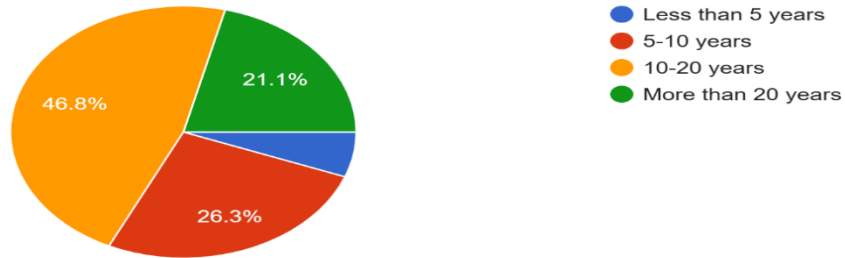
- 41.1% Of The Respondents Are General Physician Doctors.
- 17.8% Of The Respondents Are Gynecologist Doctors.
- 5.3% Of The Respondents Are Cardiologist Doctors.
- 14% Of The Respondents Are Pediatrician Doctors.
- 12.8% Of The Respondents Are Surgeon Doctors.

- 1.2% Of The Respondents Are Neurologist Doctors.

Table 5: Years Of Clinical Experience

Description	Percentage
Less Than 5 Years	5.8%
5-10 Years	26.3%
10-20 Years	46.8%
More Than 20 Years	21.1%

Years of clinical experience:
502 responses



Interpretation-

- 5.8% Of The Respondents Doctors Have Less Than 5 Years Experience.
- 26.3% Of The Respondents Doctors Have 5-10 Years Of Experience.
- 46.8% Of The Respondents Doctors Have 10-20 Years Of Experience.

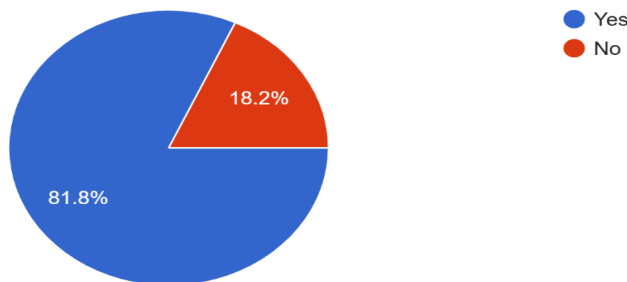
- 21.1% Of The Respondents Doctors Have More Than 20 Years Of Experience

Table 6: Awareness About Cme Programs

Description	Percentage
Yes	81.8%
No	18.2%

Are you aware of CME programs conducted by pharmaceutical companies or medical association in Vadodara?

501 responses



Interpretation-

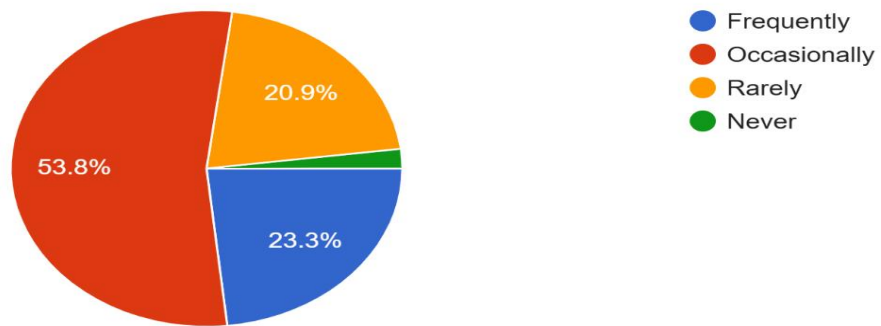
- 81.8% Of The Respondents Doctors Are Aware About Cme Programs.
- 18.2% Of The Respondents Doctors Are Not Aware About Cme Programs.

Table 7: Frequency Of Attending Cme Programs

Description	Percentage
Frequently	23.3%
Occasionally	53.8%
Rarely	20.9%
Never	2%

How frequently do you attend CME programs?

502 responses



Interpretation-

- 23.3% Of The Respondents Doctors Attend Cme Programs Frequently.
- 53.8% Of The Respondents Doctors Attend Cme Programs Occasionally.
- 20.9% Of The Respondents Doctor Attend Cme Programs Very Rarely.
- 2% Of The Respondents Doctors Never Attend

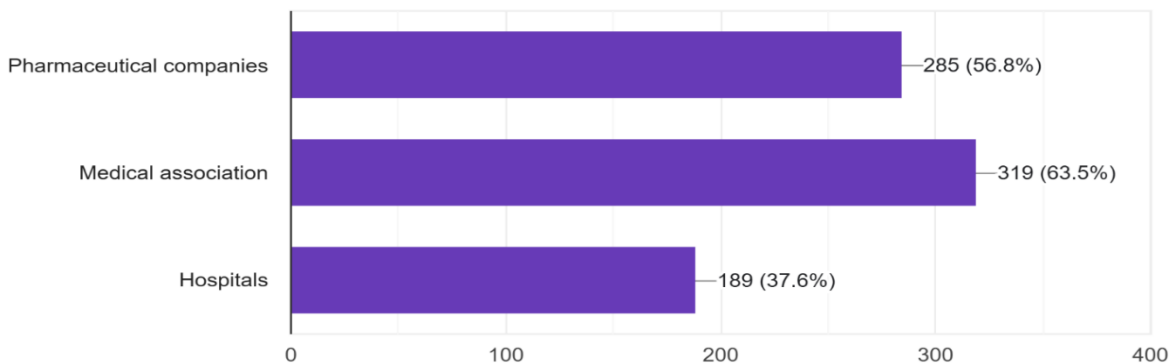
Cme Programs.

Table 7: Who Organizes Cme Programs

Description	Frequency	Percentage
Pharmaceutical Companies	285	56.8%
Medical Associations	319	63.5%
Hospitals	189	37.6%

Who usually organizes the CME programs you attend?

502 responses



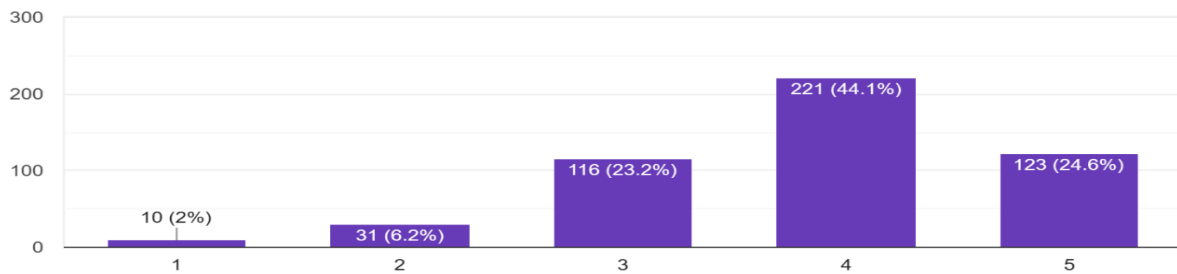
Interpretation-

- 56.8% Of The Respondent Doctors Thought That Pharmaceutical Companies Organizes Cme Programs.
- 63.5% Of The Respondent Doctors Thought That Medical Association Organizes Cme Programs.
- 37.6% Of The Respondent Doctors Thought That Hospitals Organizes Cme Programs.

Table 8: Level Of Agreement Or Disagreement With Each Of The Statements On A Five Point Scale
 Sd = Strongly Disagrees D =Disagree N = Neutral A = Agree Sa = Strongly Agree.

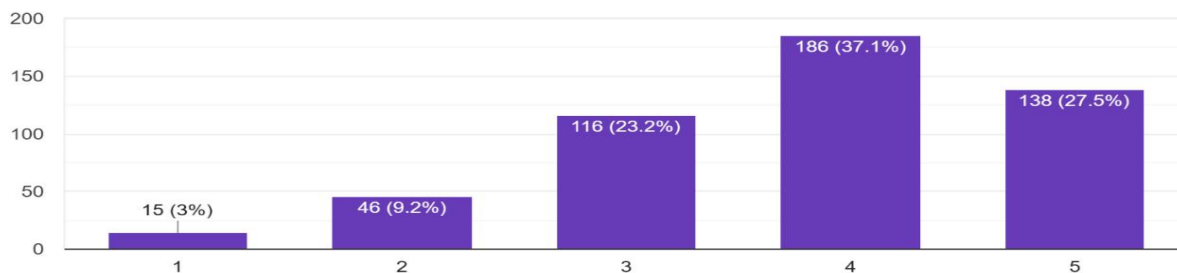
Description	Percentage
Strongly Disagree	2%
Disagree	6.2%
Neutral	23.2%
Agree	44.1%
Strongly Agree	24.6%

CME programs increase my awareness of new drugs and therapies
 501 responses



Description	Percentage
Strongly Disagree	3%
Disagree	9.2%
Neutral	23.2%
Agree	37.1%
Strongly Agree	27.5%

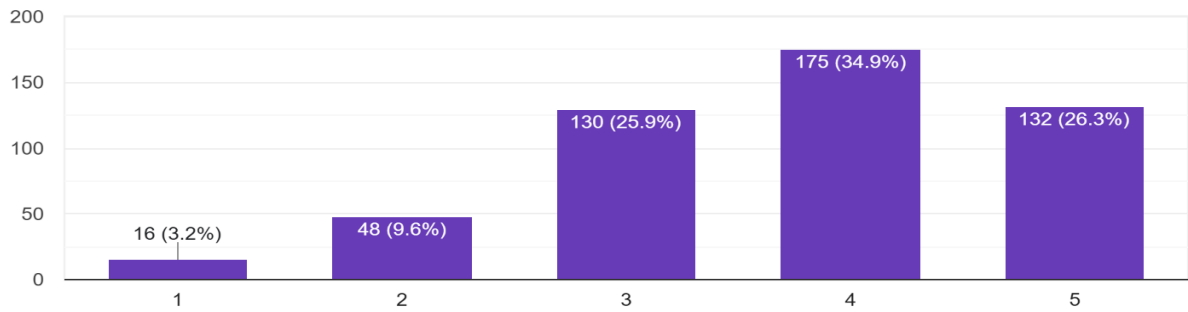
Information provided in CME programs influences my drug selection
 501 responses



Description	Percentage
Strongly Disagree	3.2
Disagree	9.6
Neutral	25.9
Agree	34.9
Strongly Agree	26.3

I'm more likely to prescribe brands discussed during CME programs

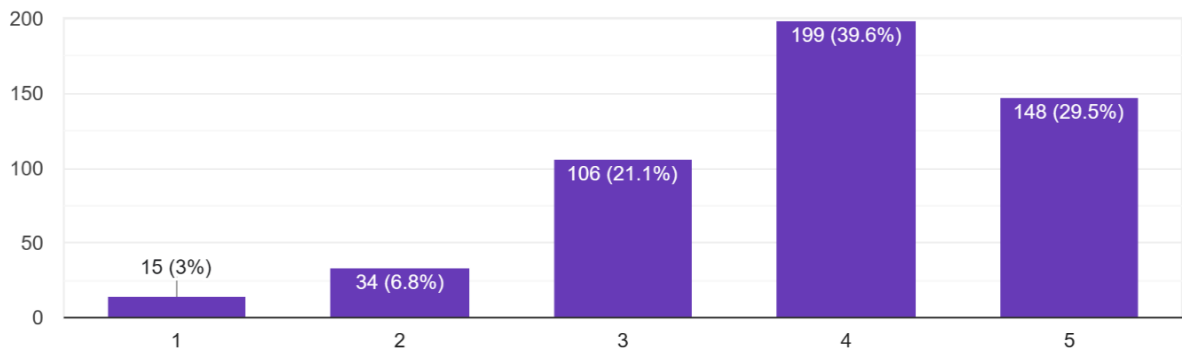
501 responses



Description	Percentage
Strongly Disagree	3
Disagree	6.8
Neutral	21.1
Agree	39.6
Strongly Agree	29.5

Scientific data presented in CME programs builds trust in specific brands

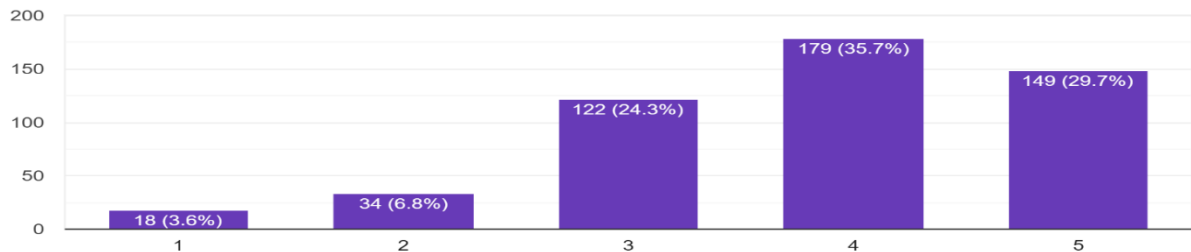
502 responses



Description	Percentage
Strongly Disagree	3.6
Disagree	6.8
Neutral	24.3
Agree	35.7
Strongly Agree	29.7

CME programs positively influence my prescribing confidence

502 responses



Interpretation-

- 35.7% Of The Respondents Agreed That Cme Programs Positively Influence Their Prescribing Confidence, While 6.8% Of The Respondents Disagreed.
- 24.3% Of The Respondents Remained Neutral Regarding The Impact Of Cme Programs On Their Prescribing Confidence.
- A Higher Proportion, 35.7%, Of Respondents Agreed With The Statement, Indicating A Strong Inclination Towards The Positive Role Of Cme Programs.
- 29.7% Of The Respondents Strongly Agreed, Further Reinforcing That Cme Programs

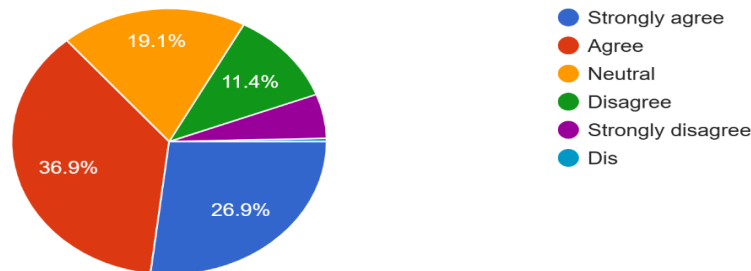
Significantly Enhance Prescribing Confidence Among Healthcare Professionals.

- Only A Small Percentage, 3.6%, Strongly Disagreed With The Statement, Showing Minimal Negative Perception.
- Overall, The Data Suggests That The Majority Of Respondents Perceive Cme Programs As Beneficial In Improving Their Prescribing Confidence, With Very Few Expressing Disagreement.

Table 9: Opinion About Compared To Medical Representatives, Cme Programs Have A Stronger Impact On My Prescription Decision

Compared to medical representatives, CME programs have a stronger impact on my prescription decision

502 responses



Description	Percentage
Strongly Agree	26.9
Agree	36.9
Neutral	19.1
Disagree	11.4
Strongly Disagree	5.7

Interpretation-

- 26.9% Of The Respondent Doctors Are Strongly Agree That Cme Programs Have Stronger Impact On Prescription Decision.
- 36.9% Of The Respondent Doctors Are Agree That

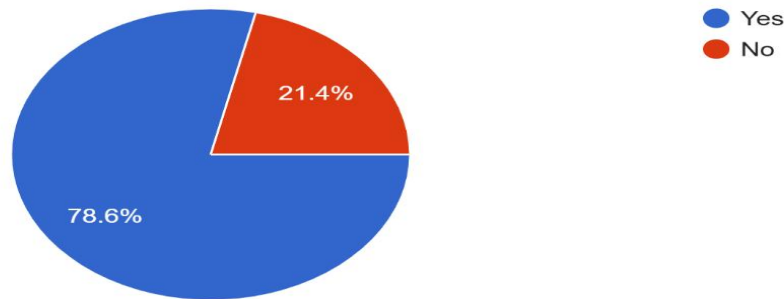
Cme Programs Have Stronger Impact On Prescription Decision.

- 19.1% Of The Respondent Doctors Feel Neutral That Cme Programs Have Stronger Impact On Prescription Decision.
- 11.4% Of The Respondent Doctors Are Disagree That Cme Programs Have Stronger Impact On Prescription Decision.
- 5.7% Of The Respondent Doctors Are Strongly Disagree That Cme Programs Have Stronger Impact On Prescription Decision.

Table 10: Effectiveness About Influence Of Prescription Behavior Is Long Term Of Not

CME programs influence my prescription behavior in the long term

501 responses



Description	Percentage
Yes	78.6
No	21.4

Interpretation:

- 78.6% Of The Respondent Doctors Feel That Cme

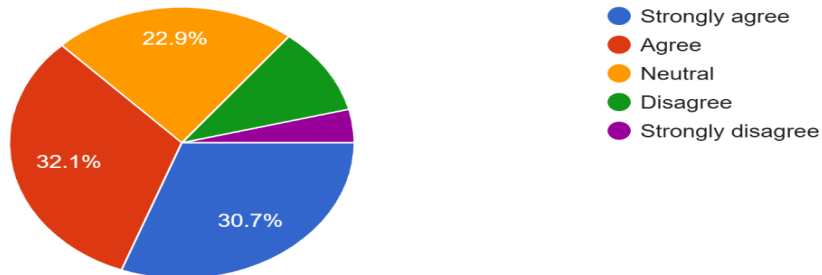
Programs Influence Is For Long Term.

- 21.4% Of The Respondent Doctors Feel That Cme Programs Influence Is Not For Long Term.

Table 11: Opinion About Cme Programs Are Educational Rather Than Promotional.

I believe CME programs are educational rather than promotional

502 responses



Description	Percentage
Strongly Disagree	4.5
Disagree	9.8
Neutral	22.9
Agree	32.1
Strongly Agree	30.7

Interpretation-

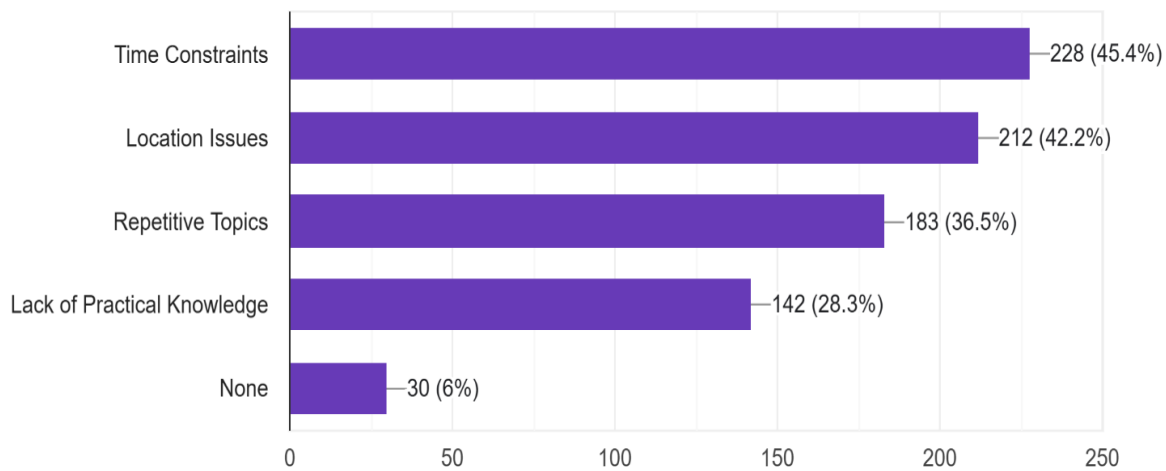
- 4.5% Of The Respondent Doctors Are Strongly Disagree That Cme Programs Are Educational Rather Than Promotional.
- 9.8% Of The Respondent Doctors Are Disagree That Cme Programs Are Educational Rather Than

- Promotional.
- 22.9% Of The Respondent Doctors Feel Neutral That Cme Programs Are Educational Rather Than Promotional.
- 32.1% Of The Respondent Doctors Are Agree That Cme Programs Are Educational Rather Than Promotional.
- 30.7% Of The Respondent Doctors Are Strongly Agree That Cme Programs Are Educational Rather Than Promotional.

Table 12: Challenges Faced By Doctors During Cme Programs.

What challenges do you face while attending CME programs

502 responses



Description	Frequency	Percentage
Time Constraints	228	45.4
Location Issues	212	42.2
Repetitive Topics	183	36.5
Lack Of Practical Knowledge	142	28.3
None	30	6

Interpretation-

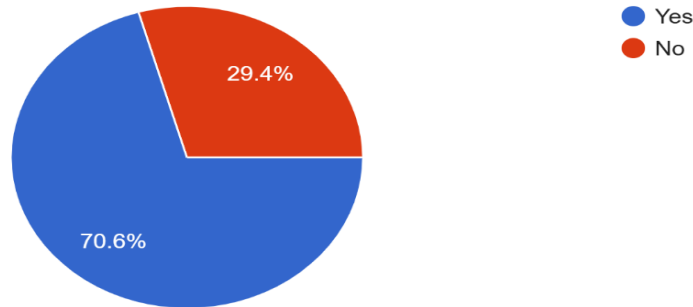
- 45.54% Of The Respondent Doctors Face Challenges In Time Constraints.
- 42.2% Of The Respondent Doctors Face

- Challenges In Location Issue.
- 36.5% Of The Respondent Doctors Face Challenge Of Repetitive Topics.
- 28.3% Of The Respondents Doctors Face Challenge Of Lack Of Practical Knowledge.
- 6% Of The Respondents Doctors Don't Face Any Challenge.

Table 13: Effectiveness Of Ethical Conduct During Cme Programs Increases Doctors Trust On The Sponsoring Company

Ethical conduct during CME programs increases my trust in the sponsoring company

496 responses



Description	Percentage
Yes	70.6
No	29.4

Interpretation-

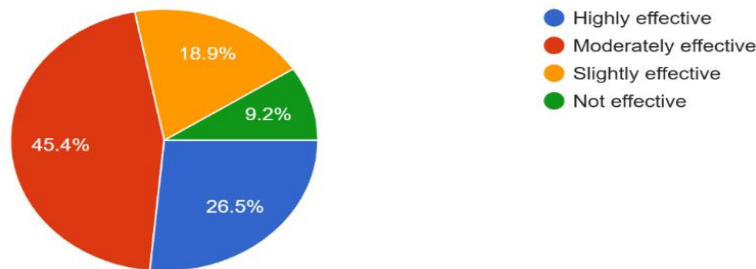
- 70.6% Of The Respondents Doctors Feel That Their Trust Increases On Sponsoring Companies Due To Cme Programs.

- 29.4% Of The Respondents Doctors Feel That Their Trust Not Increases On Sponsoring Companies Due To Cme Programs.

Table 14: Overall Effectiveness Of Cme Probrams In Influencing Prescription Decisions

Overall, how effective are CME programs in influencing your prescription behaviour?

502 responses



Description	Percentage
Highly Effective	26.5
Moderately Effective	45.4
Slightly Effective	18.9
Not Effective	9.2

Interpretation-

- 26.5% Of The Respondents Doctors Feel That Cme Programs Are Highly Effective In Influencing Prescription Behavior.
- 45.4% Of The Respondents Doctors Feel That Cme

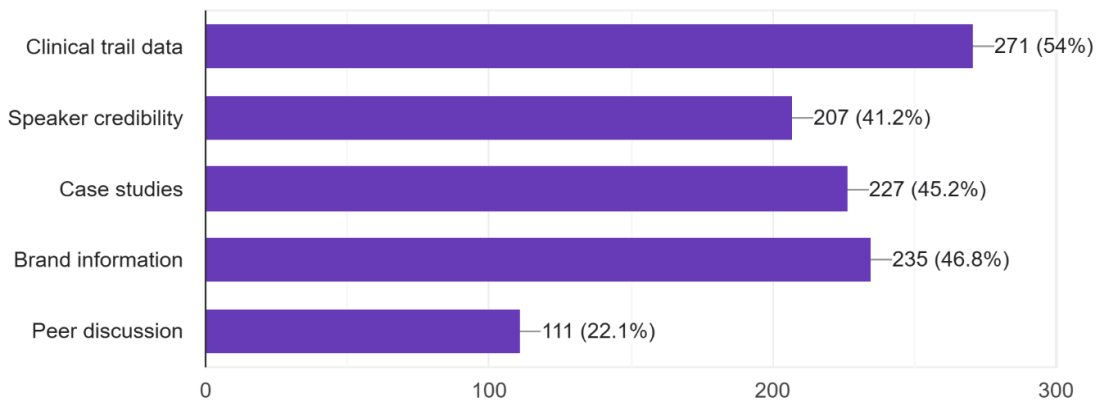
Programs Are Moderately Effective In Influencing Prescription Behavior.

- 18.9% Of The Respondents Doctors Feel That Cme Programs Are Slightly Effective In Influencing Prescription Behavior.
- 9.2% Of The Respondents Doctors Feel That Cme Programs Are Not Effective In Influencing Prescription Behavior.

Table 15: Most Influencing Factors Of Cme Programs In Prescription Decision

Which factors in CME programs most influence your prescribing decisions?

502 responses



Description	Frequency	Percentage
Clinical Trial Data	271	54
Speakers Credibility	207	41.2
Case Studies	227	45.2
Brand Information	235	46.8
Peer Discussion	111	22.1

Interpretation-

- 54% Of The Respondent Doctors Feel That Clinical Trial Data Most Influenced Their Prescription Behavior.
- 41.2% Of The Respondent Doctors Feel That Speakers Credibility Most Influenced Their Prescription Behavior.
- 45.5% Of The Respondent Doctors Feel That Case Studies Most Influenced Their Prescription Behavior.
- 46.8% Of The Respondents Doctors Feel That Brand Information Most Influenced Their Prescription Behavior.
- 22.1% Of The Respondent Doctors Feel That Peer Discussion Most Influenced Their Prescription Behavior

IV. RESULTS AND FINDINGS

- Most Doctors (81.8%) Are Aware Of Cme Programs.
- However, Many Attend Only Occasionally, And Regular Participation Is Low.
- Cme Programs Are Mainly Organized By Medical Associations And Pharmaceutical

Companies.

- Doctors Face Challenges Like Time Constraints, Location Issues, And Repetitive Topics.
- Around 70.6% Of Doctors Feel Cme Programs Increase Trust In Sponsoring Companies.
- Most Doctors Consider Cme Programs Moderately Effective In Influencing Prescription Behaviour.
- Clinical Trial Data Is The Most Important Factor Influencing Prescriptions.
- Brand Information, Case Studies, And Speaker Credibility Also Play A Role.
- Interactive Cme Sessions Are More Effective Than Lecture-Based Programs.
- Pharmaceutical-Sponsored Cme Programs May Influence Doctors' Prescribing Decisions.
- Overall, Cme Programs Have A Moderate Impact On Prescription Behaviour.

V. LIMITATIONS OF THE STUDY

- The Study Was Limited To Vadodara City Only, So Results Cannot Be Generalized To Other Regions.
- The Sample Size Was Relatively Small, Which May Affect The Accuracy Of Results.
- The Study Was Based On Self-Reported Data, Which May Include Bias Or Inaccurate Responses.
- Time Constraints Limited Deeper Analysis And Data Collection.

- Some Respondents May Not Have Given Completely Honest Or Thoughtful Answers.
- The Study Did Not Consider All Medical Specialties Equally.
- External Factors Influencing Prescription Behaviour Were Not Fully Explored.
- The Impact Of Long-Term Cme Participation Was Not Studied.
- Pharmaceutical Influence Could Not Be Measured Precisely.
- The Study Focused Only On Selected Variables And May Have Missed Other Important Factors.

VI. CONCLUSION AND SUGGESTIONS

Conclusion:

- Cme Programs Play An Important Role In Improving Doctors' Knowledge.
- They Have A Moderate Impact On Prescription Behaviour.
- Doctors Are Mainly Influenced By Clinical Data And Scientific Evidence.
- However, Pharmaceutical Sponsorship Also Affects Prescribing Decisions.
- The Effectiveness Of Cme Depends On Content Quality And Interactivity.
- Challenges Like Time, Location, And Repetitive Topics Reduce Effectiveness.
- Overall, Cme Acts As Both An Educational And Promotional Tool.

Suggestion:

- Cme Programs Should Focus More On Practical And Updated Clinical Content.
- More Interactive Sessions Should Be Conducted Instead Of Lectures.
- Programs Should Be Organized At Convenient Times And Accessible Locations.
- Efforts Should Be Made To Reduce Promotional Bias In Cme Content.
- Doctors Should Be Encouraged To Attend Cme Programs Regularly.
- Feedback From Doctors Should Be Taken To Improve Future Programs.
- Use Of Digital/Online Cme Can Increase Participation.
- More Emphasis Should Be Given To Evidence-

- Based Medicine Rather Than Brand Promotion.
- Different Specialties Should Have Customized Cme Programs.
- Regular Evaluation Of Cme Effectiveness Should Be Conducted

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