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Evaluating the Effectiveness of a Structured Self-Care Intervention in Improving Diabetes Management in Urban and Rural Populations

Shikha Gupta[1], Azra Khan[1*], Ranjana Singh[2]

[1]Department of Public Health, School of Allied Health Sciences, Noida International University, Greater Noida, India

[2]Department of Community Medicine, Noida International Institute of Medical Sciences, Greater Noida, India

***Corresponding Author:**

Dr. Azra Khan

Email ID: svgupta1501@gmail.com

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ABSTRACT

Background: Type 2 diabetes mellitus (T2DM) is a growing health challenge in both urban and rural India. Effective self-care is essential for preventing complications and premature mortality, yet adherence remains suboptimal. This study evaluates the effectiveness of a structured, theory-driven self-care intervention in improving diabetes management among adults with T2DM in urban and rural settings.

Methods: A sequential mixed-methods design was used. The formative phase included qualitative research to identify barriers and facilitators to self-care in both urban and rural populations. Insights informed the development of a structured intervention package, which was evaluated using a quasi-experimental design. Participants (n=440; 220 intervention, 220 control) were recruited from urban and rural communities in Greater Noida India. Data on self-care behaviors and clinical outcomes were collected at baseline, 6 months, and 12 months. Difference-in-difference analysis assessed intervention effectiveness.

Results: The intervention significantly improved self-care behaviors (medication adherence, diet, physical activity, blood glucose monitoring, foot care) and clinical outcomes (HbA1c, fasting blood sugar, BMI) in both urban and rural participants compared to controls. Urban participants showed slightly greater improvements in glycemic control, while rural participants benefited from tailored support strategies.

Conclusion: A structured self-care intervention, grounded in behavioral change theory, can enhance diabetes management in both urban and rural populations. Integration into existing healthcare systems is recommended for broader impact.

Keywords: *Type 2 diabetes, self-care, intervention, urban, rural, behavioral change, glycemic control, India*

1. INTRODUCTION

Type 2 diabetes mellitus (T2DM) represents a significant public health concern globally, with India projected to have the highest number of cases by 2045. Both urban and rural populations are affected, though the challenges they face differ due to disparities in healthcare access, education, and resources. Urban residents may have better access to healthcare facilities but are exposed to lifestyle risk factors, while rural populations often face limited healthcare infrastructure and lower health literacy.

Effective diabetes management requires consistent self-care, including medication adherence, dietary management, physical activity, blood glucose monitoring, and regular follow-up. The American Diabetes Association (ADA) identifies seven essential self-care behaviors, yet adherence rates in India remain low, particularly in rural areas.

Behavioral change theories, such as self-efficacy and the transtheoretical model, offer frameworks for designing interventions that support individuals in adopting and maintaining self-care behaviors. However, there is limited evidence on the effectiveness of such interventions across both urban and rural Indian populations.

This study aims to evaluate the effectiveness of a structured, theory-based self-care intervention in improving diabetes management among adults with T2DM in both urban and rural settings in Greater Noida , India.

2. METHODS

2.1 Study Design and Setting

A sequential mixed-methods approach was adopted, comprising three phases: formative qualitative research, baseline quantitative assessment, and a quasi-experimental intervention trial. The study was conducted in Greater Noida , which includes both urban and rural communities.

2.2 Participant Recruitment

Inclusion criteria:

- Adults (>30 years) with T2DM (diagnosed by medical records)
- On antidiabetic medication for at least 6 months
- Willing to provide informed consent

Exclusion criteria:

- Severe complications (e.g., cardiovascular, renal disease, cognitive impairment)
- Inability to communicate
- Pregnant women

2.3 Phase 1: Formative Research

Purposive sampling was used to select participants from urban and rural areas. Focus group discussions (FGDs) with people with T2DM and in-depth interviews (IDIs) with healthcare staff were conducted until data saturation. Thematic analysis identified barriers and facilitators to self-care.

2.4 Phase 2: Baseline Assessment

A cross-sectional survey assessed self-care practices among 700 participants (350 urban, 350 rural) using multistage random sampling. Data were collected via structured questionnaires covering demographics, medical history, and self-care behaviors. Anthropometric measurements and biomarkers (random blood sugar, HbA1c, lipid profile) were obtained.

2.5 Phase 3: Intervention Development and Implementation

The intervention package was developed based on ADA guidelines and formative research findings. It included educational materials, skill demonstrations, counseling, motivational interviewing, and behavior tracking. A quasi-experimental design assigned 220 participants each to intervention and control arms, stratified by urban and rural residence. Trained healthcare staff delivered the intervention over 3 months. Control participants received standard care and educational materials.

2.6 Data Collection and Outcomes

Assessments occurred at baseline, 3 month. Primary outcomes were changes in self-care behaviors and clinical indicators (HbA1c, fasting blood sugar, BMI, lipid profile). Secondary outcomes included self-efficacy and quality of life.

2.7 Data Analysis

Data were analyzed using SPSS v21. Descriptive statistics summarized baseline characteristics. Difference-in-difference analysis compared changes in outcomes between groups and between urban and rural subgroups. Multivariable regression adjusted for confounders.

3. RESULTS

3.1 Baseline Characteristics

Urban and rural participants were similar in age, gender, and diabetes duration. Rural participants had lower baseline health literacy and less access to diabetes education.

3.2 Intervention Effectiveness

Self-care behaviors:

The intervention group showed significant improvements in medication adherence, dietary practices, physical activity, glucose monitoring, and foot care compared to controls. Both urban and rural subgroups benefited, with urban participants showing slightly higher gains.

Clinical outcomes:

After 3 months, the intervention group had greater reductions in HbA1c and fasting blood sugar, and improvements in BMI

and lipid profiles, compared to controls. Urban participants demonstrated slightly greater improvements in glycemic control.

Self-efficacy and quality of life:

Self-efficacy scores increased significantly in the intervention group, and quality of life improved, especially in physical health and social functioning domains.

3.3 Subgroup Analysis

Rural participants faced additional barriers, including transportation and lower baseline knowledge. The intervention was adapted with local language materials and community health worker involvement.

4. DISCUSSION

This study demonstrates that a structured, theory-driven self-care intervention can significantly improve diabetes management in both urban and rural populations. The intervention's effectiveness across diverse settings highlights the need for tailored content and delivery.

Integrating such interventions into existing healthcare systems, with support from primary healthcare staff and community health workers, can enhance outcomes and reduce public health burdens. The use of behavioral change theories ensures patient-centered, adaptable interventions.

Strengths:

- Mixed-methods design
- Inclusion of urban and rural populations
- Validated tools and robust analysis

Limitations:

- Quasi-experimental design may introduce selection bias
- Differences in healthcare infrastructure between sites
- Limited generalizability beyond the study region

Future research should explore long-term sustainability, cost-effectiveness, and scalability.

5. CONCLUSIONS

A structured, theory-based self-care intervention improves diabetes management in both urban and rural populations. Integration into healthcare systems is recommended to address the growing diabetes burden in India.

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Competing Interests: None declared.

Patient Involvement: Patients were not involved in the study design or dissemination.

REFERENCES

[1] International Diabetes Federation. IDF Diabetes Atlas, 9th ed. Brussels, Belgium: 2019.

[2] American Diabetes Association. Standards of Medical Care in Diabetes—2024. Diabetes Care. 2024;47(Suppl 1):S1–S212.

[3] Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. Psychol Rev. 1977;84(2):191–215.

[4] Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: Toward an integrative model of change. J Consult Clin Psychol. 1983;51(3):390–395.

[5] Ministry of Health and Family Welfare, Government of India. National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS): Operational Guidelines. 2010.