

A STUDY TO ASSESS THE EFFICACY OF A COMPREHENSIVE EDUCATION PROGRAM ON KNOWLEDGE & AWARENESS REGARDING DIABETES MELLITUS AND ITS PREVENTION AMONG ADULTS IN SELECTED AREAS OF DISTRICT MANDI, HIMACHAL PRADESH.

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ABSTRACT

Background:

Diabetes mellitus (DM) is one of the most rapidly increasing public health challenges worldwide. It is a chronic metabolic disorder that can lead to serious complications affecting the heart, kidneys, eyes, nerves, and blood vessels. Lack of adequate knowledge and awareness regarding diabetes mellitus, its risk factors, lifestyle modification, self-management, and preventive measures may contribute to delayed diagnosis and increased complications. Comprehensive health education plays an important role in improving knowledge and awareness and promoting healthy practices among adults. **Aim:** The present study was conducted to assess the efficacy of a comprehensive education program on knowledge and awareness regarding diabetes mellitus and its prevention among adults in selected areas of District Mandi, Himachal Pradesh. **Methodology:** A quasi-experimental research design was adopted for the study. A total of 210 adults were selected, comprising 105 participants in the experimental group and 105 participants in the control group. Data were collected using a structured knowledge questionnaire and a Diabetes Mellitus Awareness Tool. The experimental group received a comprehensive education program covering general information, causes and symptoms, lifestyle modification, self-monitoring and management, complications, and preventive measures related to diabetes mellitus. The control group received routine care. Descriptive and inferential statistics were used for data analysis. **Results:** The findings revealed that the two groups were comparable at baseline. The pretest mean knowledge scores of the control and experimental groups were 13.23 ± 3.28 and 13.61 ± 4.32 , respectively, with no statistically significant difference ($t = 0.719$, $p = 0.473$). Following the intervention, the experimental group demonstrated a significant improvement in knowledge, with a post-test mean score of 25.50 ± 4.54 compared with 13.09 ± 3.08 in the control group ($t = 23.14$, $p < 0.001$). Similarly, the pretest awareness scores of the control and experimental groups were 8.34 ± 2.91 and 8.80 ± 3.28 , respectively, with no significant difference ($t = 1.067$, $p = 0.287$). After the intervention, the experimental group showed a significantly higher mean awareness score of 10.90 ± 3.56 compared with 8.68 ± 2.59 in the control group ($t = 5.157$, $p < 0.001$). In the experimental group, the proportion of participants with high awareness increased from 1.90% in the pretest to 29.52% in the post-test. A significant positive relationship was also observed between knowledge and awareness in the pretest assessment. **Conclusion:** The study concluded that the comprehensive education program was effective in significantly improving knowledge and awareness regarding diabetes mellitus and its prevention among adults. The findings highlight the importance of structured health education in promoting awareness, encouraging healthy lifestyle practices, supporting early prevention, and reducing the risk of diabetes-related complications. Comprehensive educational

programs can therefore be effectively utilized by nurses and other healthcare professionals in community-based diabetes prevention and health promotion initiatives.

Keywords: *Diabetes Mellitus, Knowledge, Awareness, Comprehensive Education Program, Prevention, Adults, Health Education.*

INTRODUCTION

Diabetes mellitus is a major and rapidly increasing global public health concern, particularly in developing countries such as India. It is a chronic metabolic disorder associated with serious complications affecting the cardiovascular system, kidneys, eyes, nerves, and other organs. The increasing prevalence of diabetes is linked to ageing, urbanization, unhealthy dietary patterns, physical inactivity, obesity, and other lifestyle-related factors.

Effective prevention and management of diabetes require adequate knowledge, awareness, and active participation in self-care practices. Understanding risk factors, symptoms, complications, lifestyle modification, medication adherence, blood glucose monitoring, and preventive measures enables individuals to make informed health decisions and reduce the risk of complications. However, inadequate knowledge and limited awareness remain important barriers to early detection, prevention, and effective self-management. Diabetes must be prevented and managed with a mix of medication and lifestyle changes. Since strict medication adherence can significantly enhance quality of life and help avoid or postpone long-term consequences, people with diabetes should actively manage their condition. A key component of successful self-management of diabetes is a patient's level of diabetes education.

Common symptoms of diabetes mellitus include excessive thirst (polydipsia), increased hunger (polyphagia), frequent urination (polyuria), blurred vision, dizziness, intense exhaustion, genital itching, nausea, vomiting, and delayed wound healing, among others. The diagnosis is validated by testing such as fasting blood glucose, random blood glucose, HbA1c, and glucose tolerance tests.

Diabetes is becoming increasingly common worldwide, affecting 8.8% of individuals in 2017 and expected to reach 9.9% by 2045. In absolute terms, this represents a 48% increase from 424.9 million cases in 2017 to a projected 628.6 million by 2045. The prevalence also increases with age, affecting approximately 5% of people aged 35-39, 10% of those aged 45-49, 15% of those aged 55-59, and nearly 20% of those aged 65-69.

Health education is an important strategy for improving diabetes-related knowledge and awareness and promoting healthy lifestyle practices. Nurses play a vital role in educating individuals, families, and communities regarding diabetes prevention and self-management. Therefore, the present study was conducted to assess the effectiveness of a comprehensive education programme on knowledge and awareness regarding diabetes mellitus and its prevention among adults in selected areas of District Mandi, Himachal Pradesh.

Problem Statement: A study to assess the efficacy of a comprehensive education program on Knowledge & awareness regarding diabetes mellitus and its prevention among adults in selected areas of District Mandi, Himachal Pradesh.

Materials and methods

Research Approach:

Quantitative research approach to assess efficacy of a comprehensive education program on Knowledge & awareness regarding diabetes mellitus and its prevention among adults.

Research design:

A quasi-experimental pretest- posttest control group design was adopted to carry out the present study.

Research setting:

The present study was conducted in Mandi, Himachal Pradesh.

Target Population:

In the present the target population includes adults who reside in Mandi, Himachal Pradesh.

Sample:

In the present study, the samples were the adults aged 18 and above at selected area of Mandi, Himachal Pradesh, who fulfils the eligibility criteria.

Sample size:

Based on power analysis (used Cochran formula) the sample size 210 adults were selected.

Sampling technique:

In this study purposive sampling technique was adopted for this study.

3.8 Sampling criteria:

Inclusion Criteria:

- People who were aged 18 years and above
- Able to understand and communicate in Hindi and English.
- Able and willing to give informed consent.
- Residing in the rural area for the last 6 months

Exclusion Criteria: Who had

- Moderate-to-severe cognitive impairment
- Severe hearing or visual impairment
- Severe acute illness or hospitalization at the time of recruitment.
- Diagnosed psychiatric illness schizophrenia, bipolar disorder, severe depression, or other major psychiatric disorders, that interfere with the study
- Already participated in a similar study within the past 6 months

3.9 Developmental and Description of Tool:

In this study the research tools consist of three sections as per the objectives of the study which were as follow-

Tool 1: Socio demographic Data Sheet

Tool 2: Knowledge questionnaire

Description of Tools:

Tool 1: Socio demographic Data Sheet

It comprises baseline information on elderly people, including age, gender, educational status, current occupational status, monthly income, type of family, and previous knowledge about diabetes mellitus.

Tool 2: Knowledge questionnaire

The major domains of the questionnaire were Basic Knowledge of Diabetes, Lifestyle, Self-Monitoring and Management, Complications, and Prevention. The tool consisted of a total of 34 items and included multiple-choice questions to be answered by elderly individuals. Each correct response was assigned 1 score and for a wrong response, 0. The total score was 34. It was further divided into Poor knowledge (0-11), Moderate knowledge (12-23), and Good knowledge (24-34). The reliability of toll was calculated by Spearman Brown's Prophecy formula, the split-half method reliability ($r=0.78$).

TOOL 3:DIABETES MELLITUS AWARENESS TOOL

This tool consists of 20 items. Each correct response was assigned 1 score and for wrong response. The total score for the tool was 20. It was further categorized into low awareness (0-7), moderate awareness (8-14), and high awareness (15-20). The reliability of the tool was calculated by split half method, Spearman Brown's Prophecy formula, and the split-half method reliability (0.82).

Description of interventional protocol:

Development of the intervention package, Comprehensive Education Program (CEP) on Diabetes Mellitus

To develop an intervention focused on intensive reading of ICMR guidelines for the management of type 2 diabetes mellitus, review of published journal articles in various sources, personal experience, and discussion with a guide were used for the development of the protocol. The researcher prepared CEP, referred to as a teaching programme. It was designed to give comprehensive information for elderly people regarding diabetes mellitus. It includes formal teaching on diabetes mellitus, causes and signs and symptoms, treatment, and prevention of diabetes mellitus.

The Objective of the Comprehensive Education Program for elderly people was:

- To enhance the knowledge regarding diabetes mellitus
- To increase the knowledge and awareness regarding the prevention of diabetes mellitus.
- To improve the lifestyle that helps to prevent and control diabetes mellitus

Implementation of the Comprehensive Education Program

CEP was conducted for duration of 60 minutes on the day of the pre-test through the interactive lecture and discussion. The medium of instruction was Hindi and the local language. Multiple A.V. aids were incorporated into the programme.

Sr. No	Content	Duration	A.V. aid
1.	Introduction	5-10 Min	PPT
2.	Causes and Symptoms	10-15 Min	PPT
3.	Management of Diabetes Mellitus	10-20Min	PPT, Chart
4.	Prevention of Diabetes Mellitus	15-35 Min	Pamphlet

Data Collection Procedure:

After receiving approval, the data were collected from Mandi, and the participants were identified based on the inclusion and exclusion criteria. The data was collected from July to September 2024. The adults were briefed by the researcher on the study objectives and the procedure of data collection. The participants were assured that information was confidential, and they were withdrawing from the study. The participants signed a consent form to show their willingness to participate in the study. The investigator met with participants and handed over the socio demographic profile, the Knowledge questionnaire, Diabetes Mellitus Awareness Tool. All participants who could read and understand Hindi filled out the tools themselves. The investigator assisted those participants who were unable to understand by reading the questions and asking them to select the most suitable answer. The pretest assessment was conducted on day 1, and the intervention was introduced on the same day to elderly people in a group of 8-10 people. The post-test was conducted after 15 days.

Plan of Data Analysis:

Data was analyzed using statistical software SPSS (version 20). Descriptive statistics viz. mean standard deviation, frequency, and percentage. Inferential statistics viz. independent 't' test, Chi-square, dependent 't' test and further, a correlation between the variables was calculated by using the two-tailed Spearman correlation formula.

RESULTS

Section: I Description of Baseline Profile of Adults

Table 4.1: Baseline Profile of adults and comparison for homogeneity between control and experimental group

(N=210)

S. No.	Variables	Control Group (n=105)		Experimental Group (n=105)		χ^2 value	df	p value
1.	Age in Years	f	%	f	%	2.030	4	0.730
a.	21-30 years	25	23.8	25	23.8			
b.	31-40 years	50	47.6	45	42.9			
c.	41-50 years	19	18.1	21	20.0			
d.	51-60 years	11	10.5	14	13.3			
2.	Gender					0.174	1	0.677
a.	Male	45	42.9	48	45.7			
b.	Female	60	57.1	57	54.3			
3.	Educational status					0.279	3	0.964
a.	No formal education	17	16.2	15	14.3			
b.	Primary education	43	41.0	44	41.9			
c.	Higher secondary education	42	40.0	42	40.0			
d.	Graduate and above	3	2.9	4	3.8			
4.	Current Occupation Status					0.033	3	0.998
a.	Govt. Job	7	6.7	7	6.7			
b.	Private job	31	29.5	30	28.6			
c.	Home maker	38	36.2	38	36.2			
d.	Self-employed	29	27.6	30	28.6			
5.	Monthly income (Rupees)					0.735	3	0.865
a.	5000-10,000 Rs.	47	44.8	33	31.4			
b.	10,001-15,000 Rs.	29	27.6	39	37.1			
c.	150001-20,000 Rs.	15	14.3	20	19.0			
d.	Above 20,000.	14	13.3	13	12.4			
6.	Type of family					2.475	2	0.290
a.	Nuclear Family	54	51.4	45	42.9			
b.	Joint Family	50	47.6	58	55.2			
c.	Extended Family	1	1.0	2	1.9			
7.	Previous knowledge about diabetes mellitus					0.183	1	0.669
a.	Yes	66	62.85	64	60.95			
b.	No	39	37.14	41	39.04			

χ^2 , $p < 0.05$, *significant, χ^2 = ,df=1,2,3,4 Yate's correction

Section: II

Description of the efficacy of a comprehensive education program on knowledge and awareness regarding Diabetes Mellitus and its prevention among adults

Table 4.2: Level of knowledge regarding diabetes mellitus and its prevention among adults in the experimental and control group (N=210)

	Control group (n=105)			Experimental group (n=105)		
	Good	Average	Poor	Good	Average	Poor
Score Range	0-11	12-23	24-34	0-11	12-23	24-34
Assessment	f (%)	f (%)	f (%)	f (%)	f (%)	f (%)
Pretest	1 (0.95)	70 (66.67)	34 (32.38)	2 (1.90)	66 (62.86)	37 (35.24)
Posttest	0 (0)	70 (66.67)	35 (33.33)	76 (72.39)	25 (23.81)	04 (3.80)

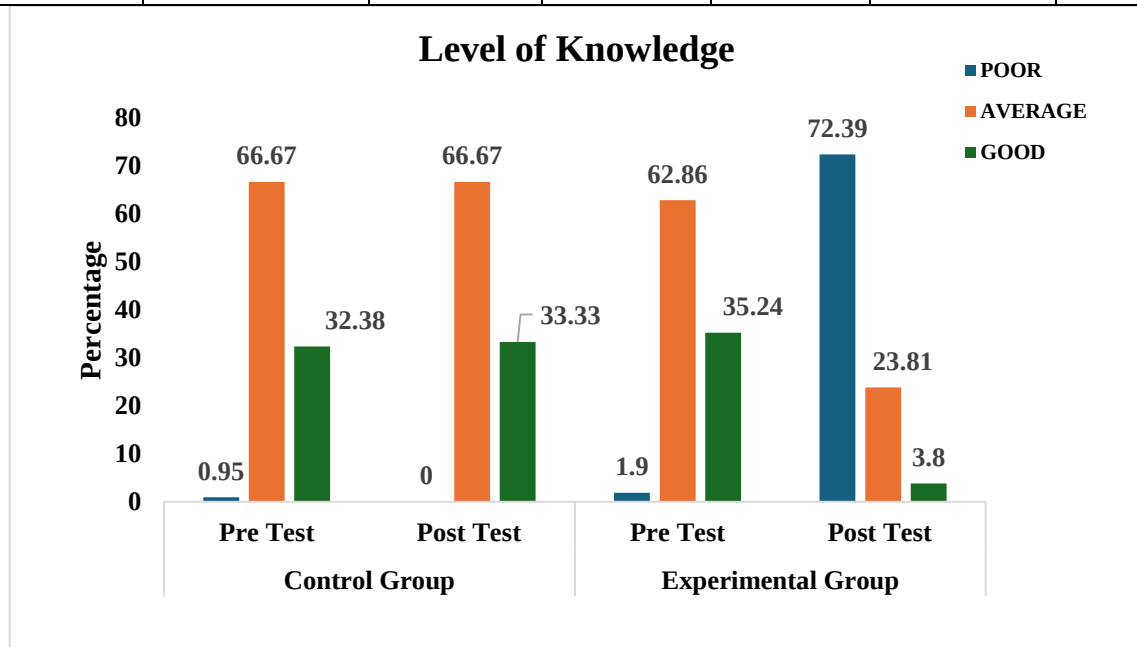


Table 4.3: Domain-specific comparison of knowledge regarding diabetes mellitus and its prevention among adults in experimental and control group

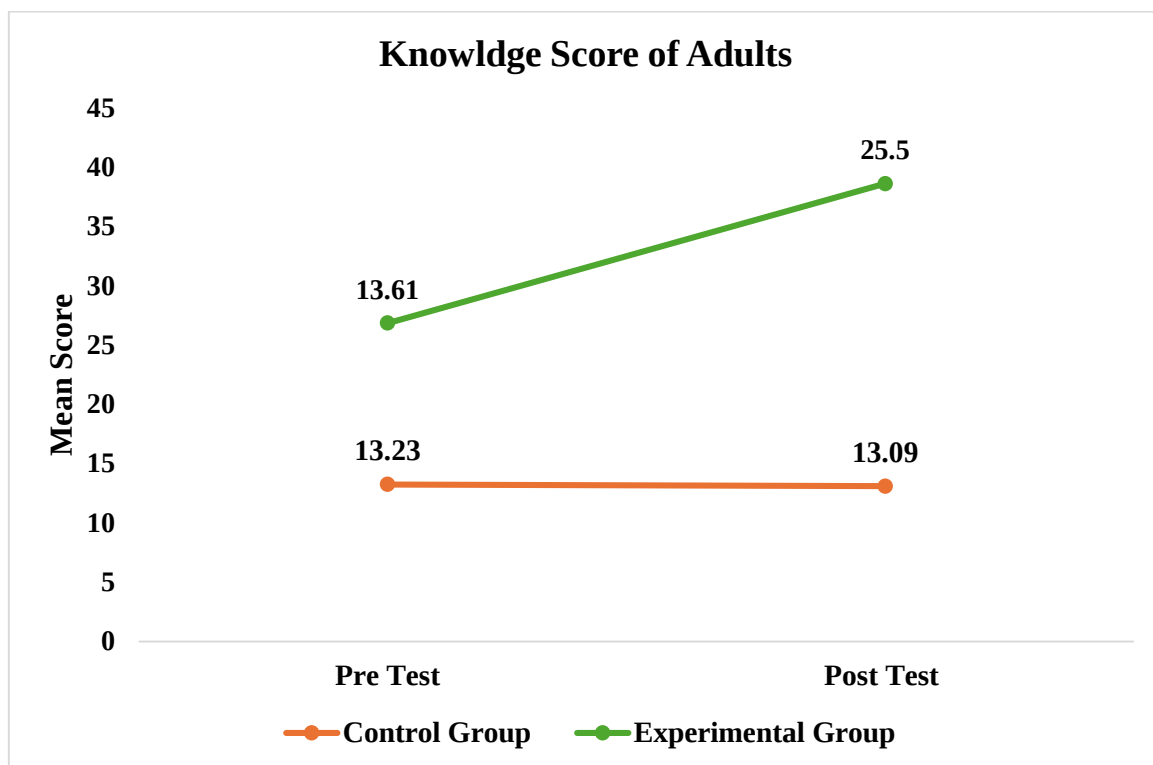
(N=210)

Domains	Assessment	Control Group (n=105)	Experimental Group (n=105)	't' value	p- value
		Mean ± SD	Mean ± SD		
General questions (Score range:0-7)	Pretest	4.24±1.49	3.89±1.52	1.692	0.092
	Posttest	3.911±.42	5.85±1.07	11.12*	<0.001
With in group		t value=4.34 p<0.001*	t value=10.49 p<0.001*		
Lifestyle (0-11)	Pretest	5.10±1.75	5.03± 1.93	0.262	9.794

	Posttest	4.651±.165	9.041±.83	18.24*	<0.001
With in group		t value=4.34 p<0.001*	t value=14.71* p<0.001		
Self-Monitoring and Management(0-6)	Pretest	1.37±1.20	1.68±1.36	1.768	0.079
	Posttest	1.48±1.20	3.99±1.48	13.44*	<0.001
Within group		t value=1.64 p>0.05	t value=13.63* p<0.001		
Complications and Prevention(0-10)	Pretest	2.5±1.38	3.0±1.57	2.403	0.017
	Posttest	3.03±1.47	6.60±2.14	14.07*	<0.001
With in group		t value=4.10* p<0.001	t value=15.36* p<0.001		

Table 4.4: Comparison of knowledge regarding diabetes mellitus and its prevention among adults after Intervention (N=210)

Assessment	Control Group (n=105)	Experimental Group (n=105)	't' value	p- value
	Mean ± SD	Mean ± SD		
Pretest	13.23±3.28	13.61±4.32	0.719	0.473
Posttest	13.09±3.08	25.50±4.54	23.14	<0.001
Within group	t value=1.31 p=0.191	t value=21.071 p<0.001		



Section: III

Description of the efficacy of a comprehensive education program on knowledge and awareness regarding Diabetes Mellitus and its prevention among adults.

	Control group (n=105)			Experimental group (n=105)		
	Low Awareness	Moderate Awareness	High Awareness	Low Awareness	Moderate Awareness	High Awareness
Score Range	0-7	8-14	15-20	0-7	8-14	15-20
Assessment	f (%)	f (%)	f (%)	f (%)	f (%)	f (%)
Pretest	43 (40.95)	61 (58.09)	1 (0.95)	41 (39.04)	62 (59.04)	2 (1.90)
Posttest	40 (38.09)	65 (61.90)	0 (0)	14 (13.33)	60 (57.14)	31 (29.52)

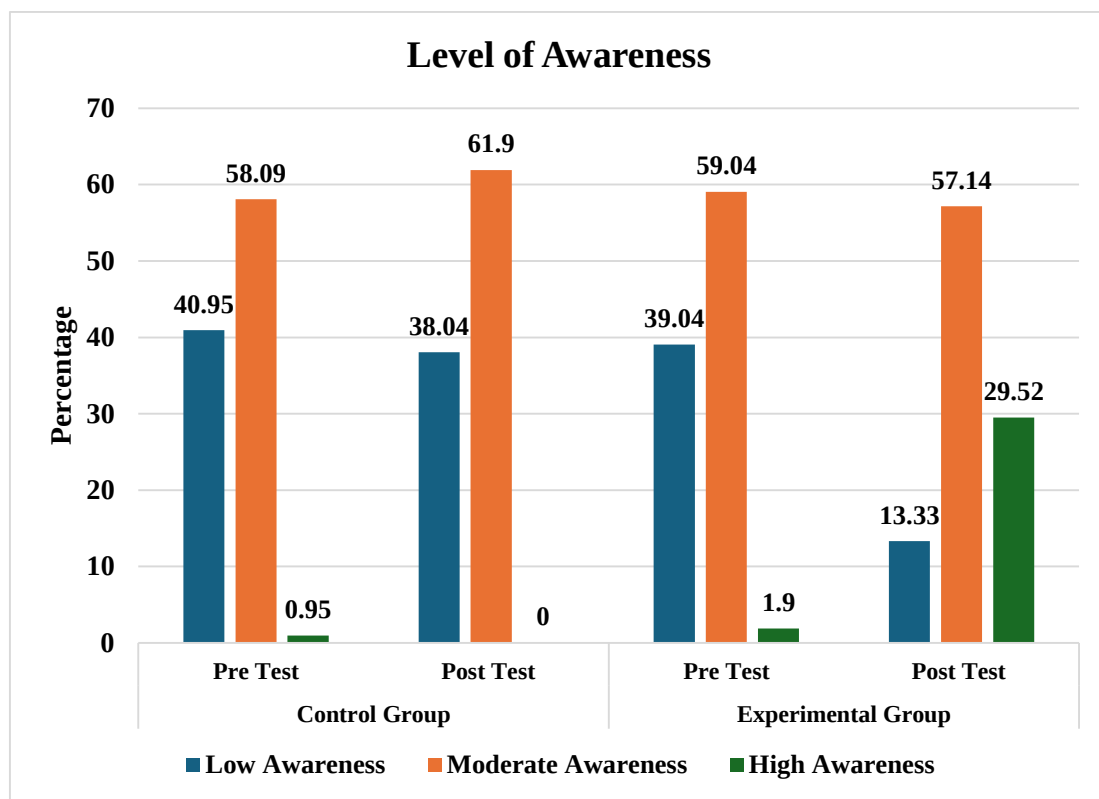
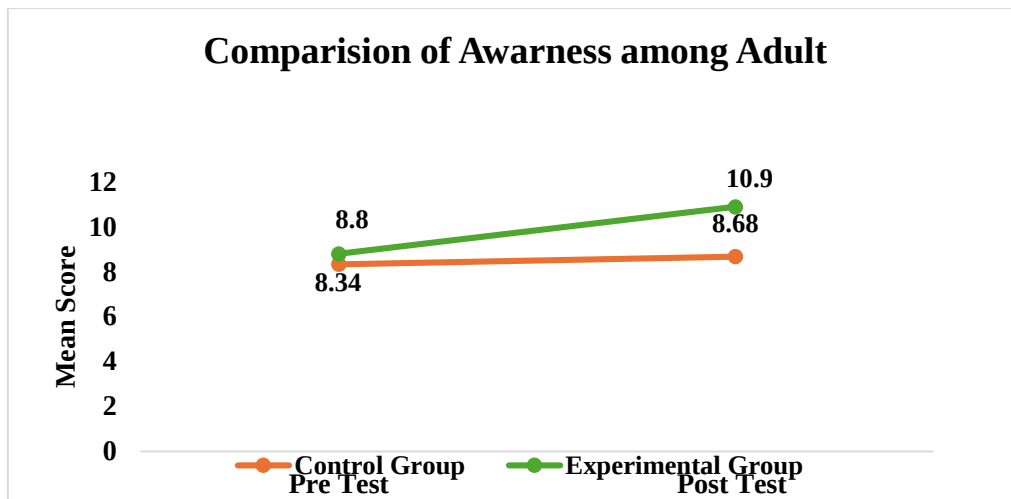


Table 4.6: Comparison of awareness regarding diabetes mellitus and its prevention among adults after Intervention (N=210)

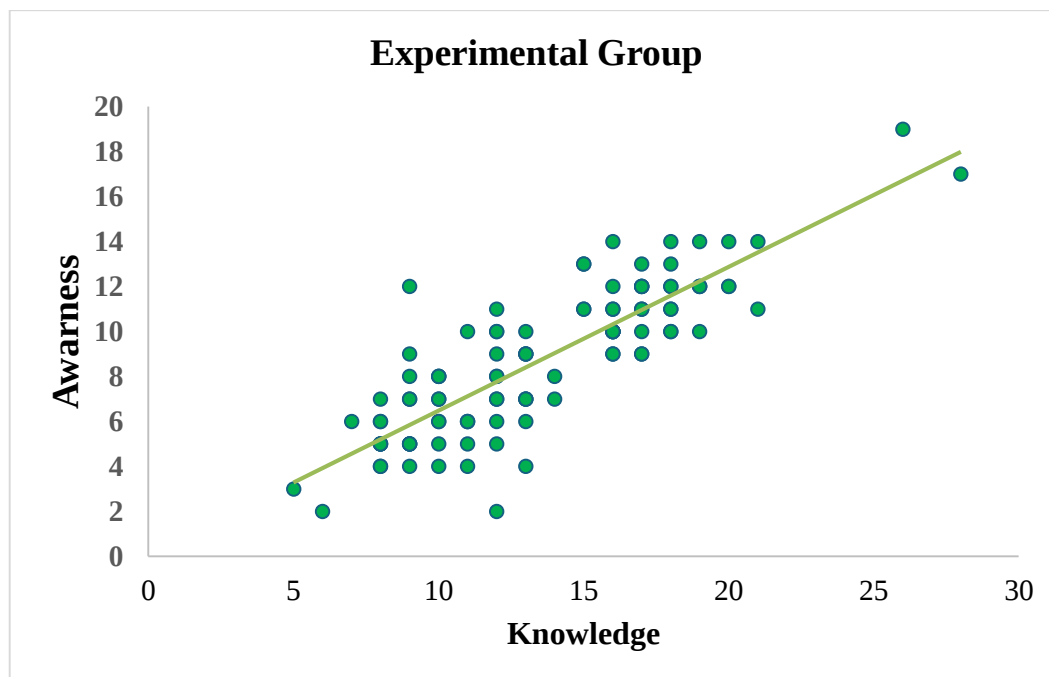
Assessment	Control Group (n=105)	Experimental Group (n=105)	't' value	p- value
	Mean ± SD	Mean ± SD		
Pretest	8.34±2.91	8.80±3.28	1.067	0.287
Posttest	8.68±2.59	10.90±3.56	5.157	<0.001
Within group	t value=1.67 p=0.09	t value=13.38 p<0.001		

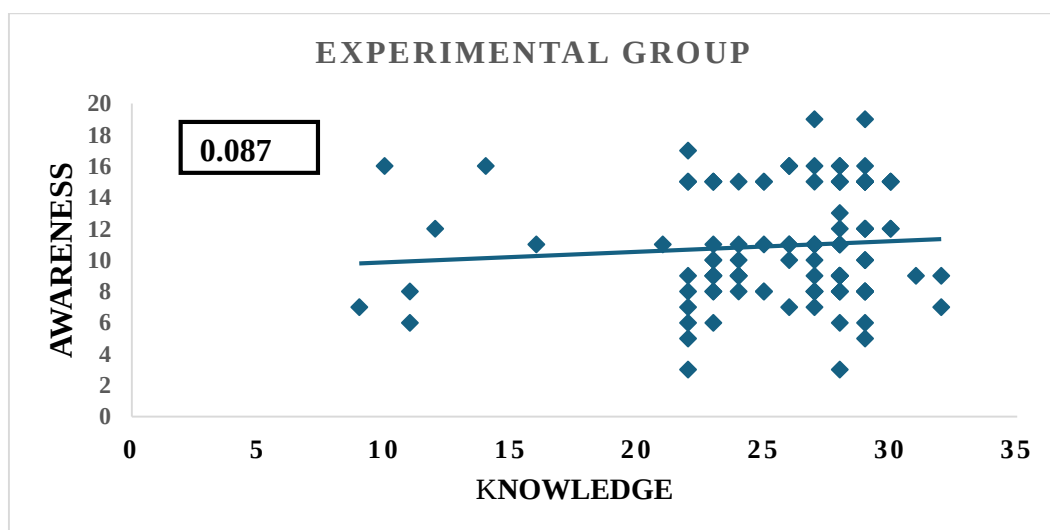
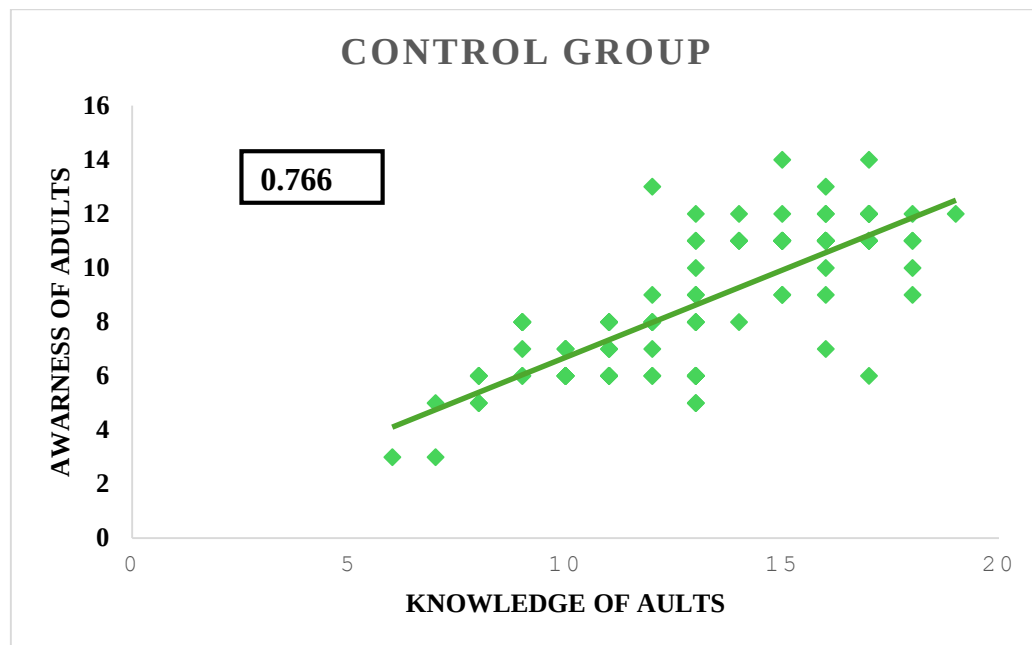
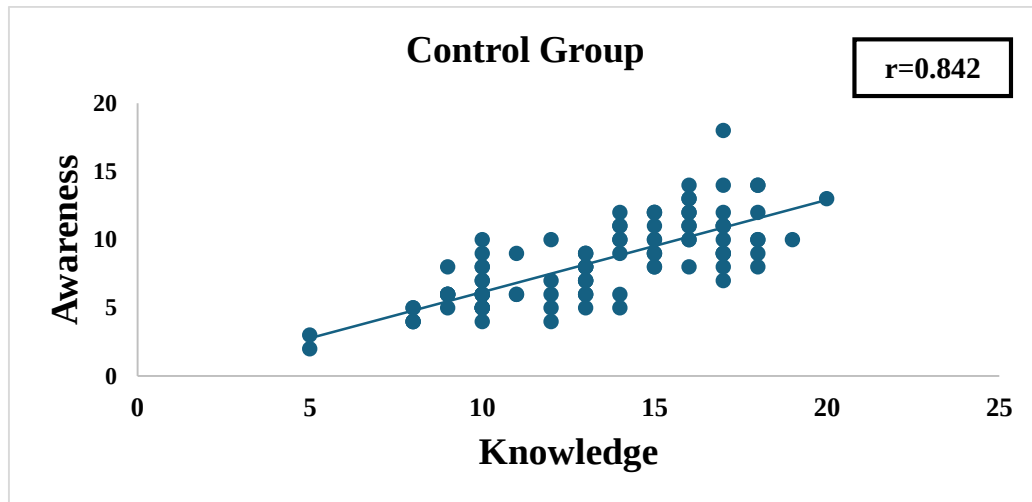


Section: IV Description of relationship between the knowledge and awareness regarding Diabetes Mellitus and its prevention among adults

Table 4.7: Correlation between pre-knowledge score and awareness regarding diabetes mellitus and its prevention among adults in the experimental and control group (N=210)

Groups	Variables	r value	p value
Experimental Group	Knowledge Vs Awareness	0.841	<0.001
Control Group		0.842	<0.001





Correlation between knowledge score and awareness regarding diabetes mellitus and its prevention among adults in the experimental and control group

Discussion

The present study demonstrated that a comprehensive education programme significantly improved knowledge and awareness regarding diabetes mellitus and its prevention among adults.

At baseline, both the experimental and control groups had similar levels of knowledge and awareness. This was important because it demonstrated that the two groups were comparable before the intervention. The majority of participants had average knowledge and moderate awareness, indicating the need for structured education.

Following the comprehensive education programme, a marked improvement was observed in the experimental group. The mean knowledge score increased from 13.61 to 25.50, while the control group showed no meaningful improvement. The statistically significant difference between the groups confirms the effectiveness of the educational intervention.

The improvement in knowledge may be attributed to the comprehensive and structured nature of the programme. The intervention covered multiple aspects of diabetes, including causes, symptoms, management, prevention, diet, physical activity, and lifestyle modification. The use of interactive teaching methods, audio-visual aids, discussion, and printed materials may have enhanced understanding and retention.

Similarly, awareness increased significantly in the experimental group. The shift from low and moderate awareness towards high awareness indicates that the intervention was successful in increasing participants' understanding of diabetes prevention. The findings support the importance of community-based education programmes in promoting awareness regarding chronic diseases.

The findings are consistent with previous studies demonstrating that structured educational interventions improve diabetes-related knowledge, attitudes, self-care abilities, and preventive practices. Health education may also encourage individuals to seek early medical care, adopt healthier lifestyles, and participate in screening programmes.

The study also highlights the important role of nurses in diabetes prevention. Nurses are in a unique position to provide health education, counselling, screening, follow-up, and support for lifestyle modification. Community-based nursing interventions can therefore contribute significantly to the prevention and control of diabetes mellitus.

Limitations

1. The study was conducted in selected areas of District Mandi, Himachal Pradesh; therefore, generalisation of the findings should be undertaken cautiously.
2. The study used a quasi-experimental design and participants were not randomly assigned to the groups.
3. The post-test assessment was conducted after a relatively short period of 15 days.
4. The study primarily assessed knowledge and awareness and did not measure long-term behavioural changes or clinical outcomes.
5. The study relied partly on self-reported information from participants.

Recommendations

1. Similar studies may be conducted using a larger sample size.
2. Randomised controlled studies may be undertaken to strengthen evidence regarding the effectiveness of educational interventions.

3. Long-term follow-up studies may be conducted to determine whether improvements in knowledge and awareness lead to sustained lifestyle changes.
4. Future studies may assess the impact of education on dietary practices, physical activity, medication adherence, and blood glucose control.
5. Community health nurses should conduct regular diabetes awareness and screening programmes.
6. Educational materials such as pamphlets, booklets, posters, and digital resources may be developed in local languages.
7. Collaborative programmes involving nurses, healthcare professionals, educational institutions, and local authorities should be promoted.
8. Further studies may evaluate the effectiveness of digital health education and mobile-based interventions in diabetes prevention.

Conclusion

The present study demonstrated that a comprehensive education programme was effective in improving knowledge and awareness regarding diabetes mellitus and its prevention among adults in selected areas of District Mandi, Himachal Pradesh.

Before the intervention, most participants had average knowledge and moderate awareness. Following the implementation of the comprehensive education programme, significant improvements were observed in both knowledge and awareness in the experimental group, while minimal change was observed in the control group.

The findings emphasise that structured and comprehensive health education is an effective strategy for improving understanding of diabetes mellitus and promoting preventive health behaviours. Nurses and other healthcare professionals have an important role in providing community-based education, promoting early detection, encouraging healthy lifestyle practices, and preventing diabetes-related complications.

Acknowledgement

The authors express their sincere gratitude to the participants who participated in the study and provided their valuable cooperation. The authors also acknowledge the support and guidance received from the concerned authorities and healthcare professionals during the conduct of the study.

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