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"Exploring the Impact of Self-Efficacy and Social Support on Type II Diabetes Self-Management in Dehradun, Uttarakhand."

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ABSTRACT

Introduction : "Diabetes mellitus (DM) is one of the most prevalent and pressing public health challenges worldwide. In particular, inadequate self-care among individuals with type 2 diabetes can result in poor glycemic control, increased risk of complications, and even mortality". The objective of the study to observe Self-efficacy and social support in Type II diabetes self-management : A correlational, cross-sectional design with a convenient sample of 450 participants was chosen from the population of Dehradun was used to conduct this study. Two questionnaires were administered: (A) the demographic and medical data questionnaire; (B) diabetes self-care activities questionnaire. The majority of participants were employed (49.8%). The gender distribution was relatively balanced, with 48.7% identifying as male and 51.3% as female. In terms of age, 48.4% of the participants were aged 50 years or older. Analysis of HbA1c levels revealed that 42.4% of the participants had readings in the 7–8.9% range, indicating that a substantial proportion exhibited suboptimal glycemic control. Impact of Self-Care activities on self-efficacy indicates an increase in self-efficacy post-intervention. The 95% confidence interval (CI) for the difference ranges from -0.461 to -0.416, signifying a consistent improvement in self-efficacy scores across participants. Social support and self-efficacy were related to medication adherence in diabetic patients, and social support can improve medication adherence in patients with diabetes by affecting self-efficacy. In summary, clinicians can focus on interventions that enhance patients' confidence in managing their health and adhering to prescribed medications. Educational programs, counselling, and regular follow-up discussions can be beneficial in building and sustaining self-efficacy, and adjustments to treatment plans and support strategies can be made based on changes in the patient's socioeconomic factors, self-efficacy, and educational background over time.

INTRODUCTION

Diabetes mellitus (DM) was first recognized as a disease around 3000 years ago by the ancient Egyptians and Indians, illustrating some clinical features very similar to what we now know as diabetes[1]. Around 4.6% of about 285 million diabetic patients in 2010 in the world, and the expectation will move higher in 2030 to 7.7% about 439million[2]. The condition is a major contributor to global mortality, with high blood glucose levels causing nearly 4 million deaths annually, and it incurs substantial economic costs, with global healthcare spending on diabetes among adults reaching approximately $850 billion in 2017. Beyond the individual, diabetes has far-reaching socio-economic impacts, burdening families, societies, and economies, particularly in low- and middle-income countries where it often coexists with other diseases, further threatening national productivity and economic stability[3]. The rapid rise in diabetes cases is attributed to a combination of factors, including population aging, urbanization, and lifestyle changes that promote unhealthy diets rich in processed foods and sedentary behaviours[4]. It is estimated that nearly 46% of diabetes cases worldwide are undiagnosed, leading to increased morbidity and mortality. Social support, encompassing healthcare professionals, family, and friends, is critical in aiding individuals with T2DM to manage their condition effectively[5].

DSME Diabetes Self-Management Education equips individuals to adapt to the psychological, social, and physical challenges of T2DM, helping them integrate disease management into their daily lives[6].

Effective self-care for T2DM patients is often hindered by multiple barriers, including educational, socioeconomic, and psychological challenges. Knowledge gaps in critical areas such as glucose monitoring, dietary adjustments, and the role of physical activity often lead to poor glycemic control and heightened risks of complications such as neuropathy,

retinopathy, and cardiovascular diseases[7]. Financial barriers are among the most significant obstacles to effective self-care[8]. Psychological challenges like denial, stress, anxiety, and burnout frequently undermine consistent self-care. Digital divide disproportionately affects elderly patients and those from low-income backgrounds, leaving them excluded from advancements that could simplify self-care[9] .

This study highlights the barriers to effective self-care, including limited awareness, financial constraints, and psychological factors, and explores the role of patient education, healthcare support, and lifestyle interventions in mitigating these challenges. This study seeks to address the diverse challenges posed by T2DM through several key objectives. By investigating the role of DSME social support, and healthcare interventions, the study highlights strategies to enhance patient outcomes.

Methodology

The research methodology was meticulously crafted to systematically explored the self-care practices and therapeutic outcomes in individuals with Type II Diabetes Mellitus. The approach integrates both quantitative and qualitative methods to provide a thorough comprehension of the topic. The quantitative component yields quantifiable data about the influence of self-care on clinical results, whilst the qualitative component gives more profound insights into the human experiences and obstacles encountered by people in managing their disease. The study employed a mixed-methods research design to comprehensively assessed the relationship between self-care practices and therapeutic outcomes in individuals with Type II Diabetes Mellitus. The quantitative component consists of a cross-sectional survey, which evaluated self-care behaviors and their direct impact on key therapeutic outcomes, such as HbA1c levels, blood pressure, and cholesterol. This approach provides a snapshot of the existing self-care practices among the study population and their effectiveness in managing diabetes. Complementing this, the qualitative component involves in-depth interviews with a subset of participants. The study was conducted in urban and semi-urban areas of Dehradun, Uttarakhand selected for their high prevalence of Type II Diabetes Mellitus and the presence of healthcare facilities that support diabetes management. These regions offer a diverse population with varying socioeconomic backgrounds, providing a comprehensive understanding of self-care practices across different contexts. The research included individuals who were 18 years of age or older and had been diagnosed with Type II Diabetes for a minimum of one year, ensuring they had established self-care routines. Whereas pregnant women or those with gestational diabetes and individuals with cognitive impairments were excluded.

sample size of 450 participants was chosen from the population of Dehradun using Convenience Sampling. The sample size was estimated using a method for a single population percentage, considering a 95% confidence level, a 5% margin of error, and a 10% nonresponse rate.

$$n = N_x \frac{\frac{z^2 * p * (1-p)}{e^2}}{N - 1 + \frac{z^2 * p * (1-p)}{e^2}}$$

n= 600*249/384.16 -599 +661

n = 450.9

where, n = size of sample, N = size of population, p = sample proportion, e = sampling mistake, z = critical value.

Approximately 450 no. of sample.

Self-Care Management: The daily activities and decisions that individuals with T2DM undertake to manage their condition. Operationally, self-care can be measured using a validated questionnaire such as the Self-Care Inventory-Revised (SCI- R).

Participants were required to complete a comprehensive survey, either in paper-based format or online. The survey was designed to capture self-reported data on four key variables: diabetes distress, social support, self-efficacy, and performance in diabetes self- care activities. The survey process was conducted at an approximate rate of two patients per day, the total time taken to complete the survey administration spanned around 225 days. The survey was administered in a manner that ensured participant confidentiality and data integrity, with clear instructions provided to guide participants through each section of the survey. Semi-structured interviews were used to collect qualitative data. The interviews were conducted using an interview procedure that investigated many facets of self-care management, such as individuals' motives, difficulties, support networks, and perceived advantages.

Data Analysis

Once collected, the survey responses were systematically entered into an Excel spreadsheet for analysis. The data analysis was conducted using SPSS version 26, incorporating both quantitative and qualitative methods.

RESULTS: Important factors were examined, including psychological health, medication compliance, physical activity, food adherence, and glucose monitoring.

Demographic Characteristics: The demographic characteristics of the study revealed significant patterns in terms of age, gender, employment status, and socioeconomic background. Table 1 indicates that most of the participants were employed (49.8%), followed by unemployed (31.3%). The gender distribution was relatively balanced, with 48.7% male and 51.3% female participants. Regarding age, 48.4% of the participants were 50 years older, highlighting a demographic that may face increased challenges in managing diabetes. This observation aligns with findings from Bellary et al.(2021) who emphasized that older adults often encounter more difficulty managing diabetes due to cognitive and physical declines associated with aging[10]. The socioeconomic profile revealed that 48.4% of the participants belonged to the middle-income group. This demographic is linked to better healthcare access and improved glycemic control, as noted by Okereke et al.(2021) who found that middle-income individuals have better access to healthcare resources[11]. Employment status also played a crucial role in self-care adherence, with Singh et al.(2021) highlighting that unemployed individuals face financial stress and reduced healthcare access, which negatively impacts their diabetes management[12]. The HbA1c readings showed that 42.4% of participants fell within the 7-8.9% range, suggesting a significant proportion with suboptimal glycemic control. BMI analysis revealed that 42.4% of participants had normal weight, while 34.7% were overweight. Cholesterol levels were predominantly in the 150-199 mg/dL range (49.1%), while elevated blood pressure was observed in both diastolic and systolic measurements. Specifically, 27.6% of participants had diastolic blood pressure in the 100-109 mmHg range, and 29.3% had systolic blood pressure in the 160-179 mmHg range. These elevated values suggest a heightened risk of cardiovascular complications also found in study by Guo et al[13](2020). Educational background and diabetes duration were also significant factors. Most participants (71.8%) had received an education on diabetes management, while 40.9% had been living with the condition for 5 to 10 years. These findings underscore the importance of continuous education and support for individuals with diabetes.

Modified Medical Outcomes Study Social Support Survey (mMOS-

SS) (Pre) Table 3 presents the pre-screening responses of participants to the Modified Medical Outcomes Study Social Support Survey (mMOS-SS), assessing both instrumental (I) and emotional (E) support. The results reveal that most participants had access to support 'All of the time' for instrumental needs such as help with daily chores (112) and meal preparation (92), indicating strong practical support systems. This observation is consistent with the findings of Busebaia et al.(2023) who emphasized that instrumental support, such as assistance with daily chores and meal preparation, significantly improves diabetes self- management outcomes[14]. Similarly, 91 participants reported having someone available 'All of the time' to assist if confined to bed, while 90 participants had access to transport for medical visits. This aligns with Kelley et al.(2020) who highlighted that access to support for mobility and medical appointments reduces the psychological burden on patients with chronic illnesses[15]. Emotional support was also well-established, as 103 participants indicated having someone 'All of the time' who understands their problems, and 99 participants had access to someone for advice on dealing with personal issues. This is in line with findings from Morales et al.(2024) who observed that emotional support plays a critical role in reducing diabetes-related distress, especially in patients struggling with the emotional demands of diabetes care[16]. Social interaction was notably high, with 98 respondents reporting access to someone to have a good time with 'All of the time.' However, areas of limited support were observed in emotional aspects, with only 81 participants feeling they had someone 'All of the time' to love and make them feel wanted. This observation aligns with the work of Noor et al.(2023) who highlighted that emotional support linked to affection and love is often underutilised but plays a crucial role in enhancing mental well-being[17]. Overall, the findings suggest that while instrumental support for daily living activities is relatively strong, emotional support, particularly related to affection, may require more attention to improve participants' overall social support systems. Interventions focusing on enhancing emotional support networks could significantly improve the mental well-being and self-management capacity of individuals with diabetes. The Modified Medical Outcomes Study Social Support Survey (mMOS-SS) (Post) Table 4 illustrates the post-screening responses of participants to the Modified Medical Outcomes Study Social Support Survey (mMOS-SS), highlighting improvements in both instrumental (I) and emotional (E) support compared to pre-screening levels. A significant increase in 'All of the time' support is evident, particularly for instrumental support. For instance, 160 participants reported having someone available 'All of the time' to help with daily chores, compared to 112 in the pre-screening phase. This finding aligns with Otanga et al.(2022) who demonstrated that interventions aimed at strengthening instrumental support networks significantly improve participants' capacity for self-care and diabetes management[18]. Similarly, the availability of support for meal preparation (131) and transport to medical appointments (133) 'All of the time' showed considerable improvement. Emotional support also increased, with 156 participants reporting access to someone who understands their problems 'All of the time,' compared to 103 pre-screening. This improvement aligns with findings from Kalra et al., (2018) who emphasized that emotional support reduces diabetes-related distress, especially in patients with high emotional vulnerability[19]. Access to affection and emotional connection also improved, as 129 participants now felt they had someone 'All of the time' to love and make them feel wanted, up from 81 in the pre-screening. Ubillos et al.(2024) observed that affection-based emotional support is essential for promoting mental well-being and resilience among individuals managing chronic illnesses[20]. The result indicates a marked enhancement in both practical and emotional support post- intervention, reflecting stronger social support networks and a greater sense of connectedness among participants. These findings underscore the importance of integrating both instrumental and emotional support mechanisms into diabetes care interventions to promote holistic well-being and improve self-management outcomes.

Impact of Self-Care activities on self-efficacy Table 5 presents the results of a paired samples test comparing self-efficacy scores before and after the intervention. The mean difference is -0.438 (SD = 0.242), indicating an increase in self-efficacy post-intervention with p-value of 0.000 ($p < 0.001$). This result confirms that the intervention led to a statistically significant improvement in participants' self-efficacy. This outcome aligns with the work of Aminuddin et al.(2021) who demonstrated that structured self-care interventions significantly improve self-efficacy, enabling better medication adherence and lifestyle changes[21]. O'Donnell et al.(2018) reported that targeted self-management education, particularly when goal-setting strategies are used, significantly improves self- efficacy[22]. Correlation Between increased social support and increased self-efficacy displays the correlation between self-efficacy and social support. The Pearson correlation coefficient is 0.023, indicating a very weak positive relationship between the two variables. This suggests that social support has a negligible effect on self-efficacy. The p-value of 0.625 ($p > 0.05$) shows that this relationship is not statistically significant, meaning there is no meaningful correlation between the level of social support and self-efficacy in managing diabetes in this sample. A study by Chan et al.(2020) found a significant positive correlation between social support and self-efficacy in individuals with diabetes, suggesting that higher levels of social support were associated with greater confidence in managing diabetes[23].

CONCLUSION

In conclusion, the study demonstrated that most participants were females aged 50 and above, employed and were belonging to middle income group. Furthermore, they demonstrated poor levels of diabetes self-care practice and high levels of emotional distress and regimen distress. Age, gender, and socioeconomic group differences in self-care practices were also noted, highlighting the need for patient-centered treatments to improve treatment results and build self-care capacity. In addition, the study found that self-care is correlated with diabetes distress.

Ethical Considerations

All participants were required to provide informed consent before participating in the study. Participant confidentiality and anonymity were maintained throughout the research process.

Abbreviations:

T2DM: type 2 diabetes mellitus

DSME: Diabetes Self-Management Education

mMOS-SS: Modified Medical Outcomes Study Social Support Survey

Variable	Frequency	Percent
Gender		
Male	219	48.7
Female	231	51.3
Employment Status		
Employed	224	49.8
Unemployed	141	31.3
Retired	85	18.9
Age group		

18-20	18	4.0
21-30	51	11.3
31-40	41	9.1
41-50	122	27.1
50 and above	218	48.4
Socioeconomic Status		
Low income	80	17.8
Middle income	218	48.4
High income	152	33.8

Table 1: Demographic Characteristics of Participants

HbA1c		
5-6.9	158	35.1
7-8.9	191	42.4
9-11.9	101	22.4
BMI		
Underweight (< 18.5)	19	4.2
Normal (18.5 - 24.9)	191	42.4
Overweight (25.0 - 29.9)	156	34.7
Obese (≥ 30.0)	84	18.7
Cholesterol Level		
0-149	89	19.8
150-199	221	49.1
200-249	104	23.1
250-299	36	8.0
Systolic Pressure		
0-119	72	16.0
120-139	126	28.0
140-159	120	26.7
160-179	132	29.3
Diastolic Pressure		
0-79	104	23.1
80-89	105	23.3
90-99	117	26.0
100-109	124	27.6
Diabetes Education		
Yes	323	71.8
No	127	28.2
Duration of Diabetes		
Less than 5 years	131	29.1
5-10 years	184	40.9
More than 10 years	135	30.0

Table 2: Baseline characteristics of study participants

Question	None of the time	A little of the time	Some of the time	Most of the time	All of the time
If you needed it, how often is someone available to help you if you were confined to bed? (I)	81	96	89	93	91
If you need it, how often is someone available to take you to the doctor if you needed it? (I)	96	84	91	89	90
If you need it, how often is someone available to prepare your meals if you are unable to do it yourself? (I)	96	91	79	92	92
If you needed it, how often is someone available to help with daily chores if you were sick? (I)	82	84	88	84	112
If you need it, how often is someone available to have a good time with? (E)	85	90	93	84	98
If you need it, how often is someone available to turn to for suggestions about how to deal with a personal problem? (E)	89	97	82	83	99
If you need it, how often is someone available who					

understands your problems?(E)	93	85	79	90	103
If you need it, how often is someone available to love and make you feel wanted? (E)	97	75	96	101	81

Table 3: The Modified Medical Outcomes Study Social Support Survey (mMOS-SS) (Pre)

Question	None of the time	A little of the time	Some of the time	Most of the time	All of the time
If you needed it, how often is someone available to help you if you were confined to bed? (I)	81	96	89	93	91
If you need it, how often is someone available to take you to the doctor if you needed it? (I)	41	90	91	95	133
If you need it, how often is someone available to prepare your meals if you are unable to do it yourself? (I)	40	104	81	94	131
If you needed it, how often is someone available to help with daily chores if you were sick? (I)	38	88	85	79	160
If you need it, how often is someone available to have a good time with? (E)	34	100	96	83	137
If you need it, how often is someone available to turn to for suggestions about how to deal with a personal problem? (E)	47	93	86	83	141
If you need it, how often is someone available who understands your problems? (E)	42	98	75	79	156
If you need it, how often is someone available to love and make you feel wanted? (E)	43	88	85	105	129

Table 4: The Modified Medical Outcomes Study Social Support Survey (mMOS-SS)(Post)

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error of Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre Self Efficacy Score-Post Self Efficacy Score	-0.43833	0.24168	0.01139	-0.46072	-0.41594	-38.474	449	0.001`

Where **t-** Student t-test, **df** -Degree of Freedom

Table 5: Paired Samples Test Comparing Pre and Post Self-Efficacy Scores

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