International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Empowering Adolescents: Self-Efficacy and Diabetes Management in Type 1 Diabetes at a Tertiary Care Hospital

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Abstract

Adolescents with Type 1 diabetes face challenges in managing their condition, requiring insulin administration, glucose monitoring, and lifestyle adjustments. This study assessed self-efficacy and diabetes self-management among 60 adolescents at a tertiary care hospital using a descriptive design and non-probability purposive sampling. Data were collected through socio-demographic details, the Self-Efficacy Brazilian Scale, and a Self-Management Scale. Results showed that 45% of participants had low self-efficacy, while 55% demonstrated moderate levels. Regarding self-management, 35% had poor scores, and 65% had moderate scores. A significant positive correlation (p=0.01) was found between self-efficacy and self-management, suggesting that higher self-efficacy enhances adherence to self-management behaviours. These findings emphasise the importance of fostering adolescent self-efficacy to improve diabetes care. Tailored interventions to build self-efficacy can empower adolescents, promoting effective diabetes self-management and ensuring better long-term health outcomes in this critical developmental stage.

Keywords: Adolescence, Type 1 diabetic mellitus, self-efficacy, self-management.

Introduction:

Type 1 diabetes mellitus, a chronic autoimmune condition caused by the destruction of insulin-producing beta cells, typically manifests in childhood or early adulthood and requires lifelong management through insulin administration, blood glucose monitoring, and lifestyle adjustments. Adolescence, spanning ages 10 to 19, is a pivotal developmental stage marked by physical, emotional, and social changes, posing unique challenges for adolescents managing Type 1 diabetes, as hormonal shifts can impact insulin sensitivity and the desire for independence may hinder adherence to treatment. Self-efficacy, defined as the belief in one's ability to accomplish tasks, plays a critical role in diabetes self-management, influencing adherence to treatment routines, glycemic control, and overall well-being. High self-efficacy is linked to better health outcomes and emotional resilience, while low self-efficacy can result in diabetes burnout and poor management. Understanding these dynamics is vital for promoting effective self-management in adolescents, fostering autonomy, and ensuring better long-term health outcomes.

Background of the Study

Global Scenario: The WHO reports that 422 million people globally have diabetes, with Type 1 diabetes comprising 5-10% of cases. In 2019, diabetes caused 1.5 million deaths, many involving young people. Type 1 diabetes incidence varies by region, with higher rates in countries with advanced healthcare systems.

National Scenario: In India, around 97,700 children under 15 have Type 1 diabetes, with an annual incidence of 3-5 cases per 100,000 in urban areas. The prevalence is rising, with regional variations and increasing diagnoses annually.

Tamil Nadu scenario: In Tamil Nadu, around 25,000 children and adolescents have Type 1 diabetes, with an annual incidence of 5-10 cases per 100,000, reflecting broader national trends in prevalence.

Chennai Scenario: In Chennai, approximately 5,000 to 7,000 children and adolescents live with Type 1 diabetes, with an annual incidence of 10-15 cases per 100,000 children.

Need for the study

Millions of deaths are attributed to complications from poorly managed Type 1 diabetes, highlighting the critical need for effective self-management strategies. This study aims to assess the role of self-efficacy in diabetic self-management among adolescents with Type 1 diabetes. Self-efficacy, or the belief in one's ability to manage diabetes, is vital for encouraging adherence to tasks such as blood glucose monitoring, insulin therapy, and dietary management. Research shows that adolescents with higher self-efficacy experience better glycemic control and fewer complications. By understanding the factors that influence self-efficacy, this study intends to provide insights for creating interventions tailored to the specific needs of adolescents. Improving self-efficacy can empower young individuals to take ownership of their diabetes management, leading to better health outcomes. The study's findings may contribute to public health initiatives and offer evidence-based recommendations to improve diabetes care for adolescents globally, fostering proactive approaches to managing Type 1 diabetes.

Statement of the Problem

"Determine the self-efficacy and diabetic self-management among adolescents with type 1 diabetic mellitus." at tertiary care hospital"

Primary Objective: To determine the self-efficacy and diabetic self-management among adolescents with Type 1 diabetes mellitus.

Secondary Objectives:

- To correlate the relationship between self-efficacy and diabetic self-management.
- To associate self-efficacy and diabetic self-management with their selected demographic variables.

Operational Definitions

Determine:

To identify and establish factors or conditions that influence a specific outcome or result in diabetes management.

Self-efficacy: An adolescent's belief in their ability to manage diabetes through tasks like insulin administration and monitoring**.**

Diabetic self-management: The process by which adolescents manage diabetes through insulin use, blood glucose monitoring, and lifestyle adjustments.

Adolescence: The developmental stage from ages 11 to 19, is characterized by rapid physical, emotional, and social changes and growth.

Type 1 diabetes mellitus: A chronic condition where the pancreas produces little or no insulin, requiring lifelong management and monitoring.

Assumptions

Adolescents with higher self-efficacy in diabetes management are expected to demonstrate better self-management behaviours and improved outcomes.

Hypothesis

H1: The significant relationship between self-efficacy and diabetic self-management.

H2: The significant association between self-efficacy and diabetic self-management with their selected demographic variables.

Delimitations

The study focused on adolescents with Type 1 diabetes mellitus, conducted over four weeks in the diabetic OPD.

Methodology

Research Approach & Design

Quantitative Descriptive study.

Research Setting

Diabetic OPD, ICH, Chennai.

Study Population

Adolescence with type 1 diabetic mellitus.

Sample Size

60 Adolescence with type 1 diabetic mellitus

Sampling Technique

Non-randomized purposive sampling technique

Sampling Criteria

Inclusion Criteria:

- Adolescence with the range of 11 – 19 yrs.

- Children who are affected with type 1 diabetic mellitus.
- Available during study.

Exclusion Criteria:

- Adolescents who are not willing to participate.
- Children who are sick during the study period.

Data Collection Instruments

- **Demographic Variables**: Age, sex, residency, weight, class, food
- **Self-efficacy Brazilian scale, Perceived self-management scale**

Reliability and Validity

Content validity was assessed by nursing and paediatric experts, who suggested modifications. After revisions, the tool was approved. A Cronbach's alpha value of 0.70 confirmed reliability.

Ethical Considerations

The study was carried out after obtaining ethical clearance from the ethical committee and the Director of the Institute of Child Health and Hospital for Children.

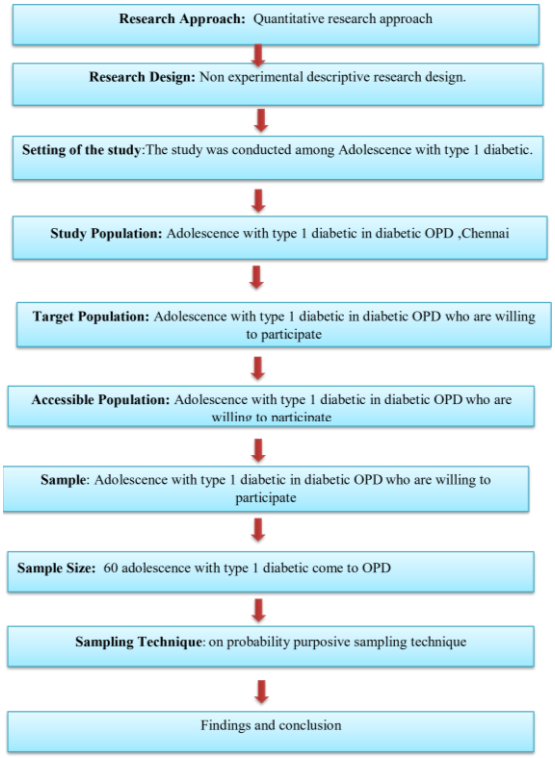

FIG.1. SCHEMATIC PRESENTATION

Results

The results revealed that 45.00% of adolescents had low self-efficacy scores, while 55.00% had moderate self-efficacy scores. Additionally, 35.00% of adolescents had poor self-management scores, and 65.00% had moderate self-management scores (P=0.01). A significant positive, moderate correlation was found between self-efficacy scores and self-management scores, indicating that as adherence scores increased, self-management scores also increased moderately. The association between self-efficacy scores and demographic variables showed that males and urban adolescents had higher self-efficacy and self-

management scores compared to their female and rural counterparts. Statistical significance for these associations was calculated using the chi-square test. The findings highlight that gender and urban living may contribute to better self-management and self-efficacy in adolescents with Type 1 diabetes. These results suggest that tailored interventions may be needed to support rural or female adolescents in managing their condition effectively.

TABLE 1. LEVEL OF SELF-EFFICACY SCORE

Level of neurologic deficit score	**Number of Stroke patients**	**%**
No stroke	0	0.00%
Minor stroke	14	23.33%
Moderate stroke	42	70.00%
Moderate to severe stroke	4	6.67%
Severe stroke	0	0.00%
Total	60	100.0%

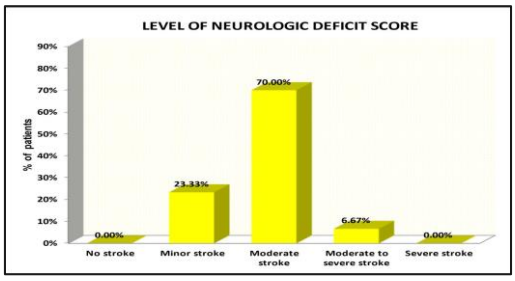

FIG.2.LEVEL OF NEUROLOGICAL DEFICIT SCORE

TABLE 2. LEVEL OF DIABETIC SELF-MANAGEMENT SCORE

Level of management score	Number of adolescents	%
Poor	21	35.00%
Moderate	39	65.00%
High	0	0.00%
Total	60	100.0%

FIG.3.LEVEL OF DIABETIC SELF-MANAGEMENT SCORE

TABLE 3. ASSOCIATION BETWEEN LEVEL OF SELF-EFFICACY SCORE AND ADOLESCENTS' DEMOGRAPHIC VARIABLES

Demographic variables		**SELF-EFFICACY SCORE**				**n**	**Chi-square test**
		Low		**Moderate**			
		n	**%**	**n**	**%**		
Age	**11-13 years**	**23**	**42.59%**	**31**	**57.41%**	**54**	**X2=1.26 p=0.26(NS)**
	14-16 years	**4**	**66.67%**	**2**	**33.33%**	**6**	

	17-19 years	0	0.00%	0	0.00%	0	
Sex	Male	6	27.27%	16	72.73%	22	X2=4.41 p=0.05*(S)
	Female	21	55.26%	17	44.74%	38	
Residency	Urban	10	31.25%	22	68.75%	32	X2=5.23 p=0.05*(S)
	Rural	17	60.71%	11	39.29%	28	
Weight	30-35 years	13	50.00%	13	50.00%	26	X2=1.37 p=0.50(NS)
	36-40 years	10	37.04%	17	62.96%	27	
	41-45 years	4	57.14%	3	42.86%	7	
Class	6th to 8th	23	42.59%	31	57.41%	54	X2=1.26 p=0.26(NS)
	9th to 12th	4	66.67%	2	33.33%	6	
	Others	0	0.00%	0	0.00%	0	
Food	Vegetarian	6	40.00%	9	60.00%	54	X2=0.20 p=0.65(NS)
	Non Vegetarian	21	46.67%	24	53.33%	6	

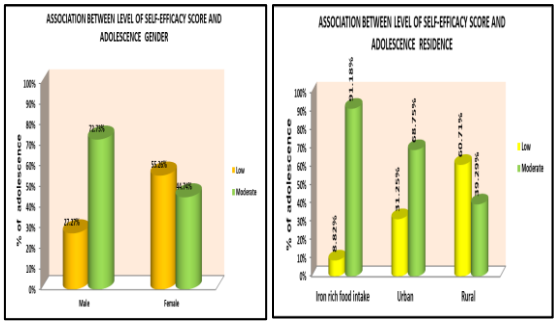

FIG.4.ASSOCIATION BETWEEN LEVEL OF SELF-EFFICACY SCORE AND ADOLESCENTS' DEMOGRAPHIC VARIABLES

TABLE 4. ASSOCIATION BETWEEN LEVEL OF SELF-MANAGEMENT SCORE AND ADOLESCENTS' DEMOGRAPHIC VARIABLES

Demographic variables		SELF-MANAGEMENT SCORE				n	Chi-square test
		Poor		Moderate			
		N	%	n	%		
Age	11-13 years	20	37.04%	34	62.96%	54	X2=0.99 p=0.32(NS)
	14-16 years	1	16.67%	5	83.33%	6	
	17-19 years	0	0.00%	0	0.00%	0	
Sex	Male	4	18.18%	18	81.82%	22	X2=4.32 p=0.05*(S)
	Female	17	44.74%	21	55.26%	38	
Residency	Urban	7	21.88%	25	78.12%	32	X2=5.19 p=0.05*(S)
	Rural	14	50.00%	14	50.00%	28	

Weight	**30-35 years**	**8**	**30.77%**	**18**	**69.23%**	**26**	**X2=1.74 p=0.42(NS)**
	36-40 years	**9**	**33.33%**	**18**	**66.67%**	**27**	
	41-45 years	**4**	**57.14%**	**3**	**42.86%**	**7**	
Class	**6th to 8th**	**20**	**37.04%**	**34**	**62.96%**	**54**	**X2=0.99 p=0.32(NS)**
	9th to 12th	**1**	**16.67%**	**5**	**83.33%**	**6**	
	Others	**0**	**0.00%**	**0**	**0.00%**	**0**	
Food	**Vegetarian**	**5**	**33.33%**	**10**	**66.67%**	**54**	**X2=0.02 p=0.88(NS)**
	Non-Vegetarian	**16**	**35.56%**	**29**	**64.44%**	**6**	

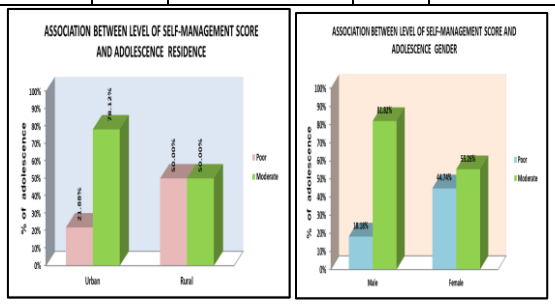

FIG.5.ASSOCIATION BETWEEN THE LEVEL OF SELF MANAGEMENT SCORE WITH THEIR SELECTED DEMOGRAPHIC VARIABLES

Discussion

The study explored the association between self-efficacy and diabetic self-management among adolescents with Type 1 Diabetes Mellitus (T1DM). The findings revealed that 45% of adolescents had low self-efficacy, while 55% had moderate self-efficacy. These results align with **Huda M Atiyeh et al. (2024)**, who reported that adolescents exhibited high self-efficacy for basic diabetes management but moderate to low self-efficacy for complex tasks such as insulin dose adjustment and managing ketoacidosis. Regarding self-management, 35% of adolescents had poor self-management scores, and 65% had moderate scores. This is consistent with **Nahid Zarifsaniey et al. (2022)**, who demonstrated the effectiveness of digital storytelling in enhancing self-management behaviors among adolescents. A significant moderate positive correlation ($r = 0.43$, $p = 0.01$) was found between self-efficacy and self-management, with urban males showing better outcomes. This supports **NKEMJIKA Okonkow et al. (2023)**, who identified increased confidence and the use of diabetes devices as critical factors for improved self-management. These findings emphasize the importance of personalized interventions to enhance adolescents' self-efficacy and self-management practices.

Implications of the Study

The study's findings hold significant implications for nursing practice, administration, education, and research.

Nursing Education

- Conduct seminars on glycemic control and diet management.
- Motivate students to explore strategies for managing Type 1 Diabetes.
- Use the study as a reference for nursing professionals.

Nursing Administration

- Conduct CNE and in-service education on managing Type 1 Diabetes.

- Develop and promote non-pharmacological measures for diabetes management.
- Plan training programs for health personnel on nursing interventions and learning modules.

Nursing Practice

- Implement nursing interventions for diabetic self-management.
- Use findings to plan regular health education sessions for Type 1 Diabetes.
- Educate on diabetic diet management through teaching, demonstration, and counselling.

Nursing Research

- Organize seminars on glycemic control and diet management.
- Inspire students to investigate strategies for managing Type 1 Diabetes.
- Use the study as a reference for nursing research.

Limitations

- Sample size was limited to 60 adolescents only.
- Difficulty obtaining permission from the diabetic unit.
- The challenge in finding Indian reviews on nursing interventions for diabetic self-management.

Recommendations

- Compare self-efficacy, self-management, and knowledge in diabetes.
- Evaluate tailored interventions for adolescent diabetes management.
- Explore mothers' experiences with adolescents having Type 1 Diabetes.

Conclusion

The study concludes that self-efficacy significantly influences self-management in adolescents with Type 1 Diabetes Mellitus, though it may vary by race. Efforts to enhance self-efficacy can improve diabetic self-management behaviors in this age group, highlighting the importance of tailored interventions for better diabetes care and outcomes.

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