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Effectiveness of Safe Insulin Practice on Child Self-Efficacy and Satisfaction in Type-1 Diabetes Mellitus: Exploring Mothers Hope and Experiences

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Abstract: This study aimed to explore mothers' hope and experiences and to evaluate the effectiveness of a safe insulin practice intervention on self-efficacy and satisfaction among children (≤12 years) with Type-1 Diabetes Mellitus (T1DM) at a tertiary care teaching hospital. An exploratory sequential mixed-methods design was used. Qualitative data were collected from eight mothers through semi-structured interviews and analyzed thematically. Subsequently, a quantitative pre-experimental one-group pre-test post-test design was conducted with 30 children with T1DM, who received a structured teaching program on safe insulin practices. Self-efficacy (Allen's Scale) and satisfaction (Clare Bradley's Scale) were assessed before and after the intervention. Qualitative findings revealed themes of initial shock and distress, evolving coping mechanisms, and profound hope fueled by observed improvements and support. Quantitative results showed a significant increase in children's mean self-efficacy scores from 89.37 (SD 6.820) to 125.60 (SD 2.978) (t=23.701, p<0.001) and mean satisfaction scores from 29.87 (SD 5.211) to 36.50 (SD 3.093) (t=7.740, p<0.001) post-intervention. The study concludes that a structured educational intervention on safe insulin practices significantly enhances self-efficacy and satisfaction in children with T1DM, and underscores the resilient journey of hope experienced by their mothers.

Keywords: *Type-1 Diabetes; Mothers Hope; Children; Self-Efficacy; Satisfaction; Safe Insulin Practice; Mixed-Methods*

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I. INTRODUCTION

Type-1 Diabetes Mellitus (T1DM) is a chronic autoimmune condition characterized by the destruction of pancreatic beta-cells, leading to absolute insulin deficiency, primarily affecting children and young adults [1]. Globally, the incidence of T1DM in children is a significant concern, with millions affected and requiring lifelong insulin therapy and meticulous management to prevent acute and long-term complications [2]. The diagnosis of T1DM in a child imposes a substantial emotional, physical, and financial burden on families, particularly mothers, who often serve as primary caregivers [3]. Effective management, centered on safe insulin administration, regular blood glucose monitoring, and dietary adjustments, is crucial for maintaining glycaemic control and improving quality of life [4].

Children's self-efficacy, their belief in their ability to manage their diabetes, and their satisfaction with treatment are critical factors influencing adherence and metabolic outcomes [5]. However, achieving optimal self-management is often challenging due to the complexity of the regimen and the psychosocial impact of the disease. Mothers' experiences, their hopes, and their coping strategies play a pivotal role in navigating this journey. While quantitative studies often assess the effectiveness of interventions, understanding the lived experiences of caregivers provides richer context and deeper insights. This study, therefore, adopted a mixed-methods approach to explore the hope and experiences of

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mothers of children with T1DM and to quantitatively assess the effectiveness of an educational intervention on safe insulin practices on the self-efficacy and satisfaction levels of these children. The findings aim to inform targeted support strategies and educational programs for families managing pediatric T1DM.

II. MATERIALS AND METHODS

A. Research Approach and Design

This study employed an exploratory sequential mixed-methods research design.

B. Qualitative Phase

Eight mothers of children with T1DM were selected using purposive sampling from the paediatric outpatient department of a tertiary care teaching hospital in Kuppam, Andhra Pradesh. In-depth, semi-structured interviews were conducted to explore their hope and experiences related to their child's T1DM and its management. Interviews, lasting 20-30 minutes, were audio-recorded, transcribed verbatim, and subjected to thematic analysis to identify recurring patterns and themes.

C. Quantitative Phase

Based on insights from the qualitative phase and existing literature, a structured teaching program on safe insulin practices was developed. A pre-experimental one-group pre-test post-test design was used with 30 children (≤12 years of age, able to self-administer insulin or with parental assistance) with T1DM, selected via convenience sampling from the same setting.

D. Data Collection Tool

- Demographic proforma for mothers and children.
- Allen's Self-Efficacy for Diabetes Scale (SED) was used to assess children's self-efficacy. Scores range from 35-140, with higher scores indicating better self-efficacy (Very poor: 0-35, Poor: >35-70, Good: >70-105, Very good: >105-140)
- Clare Bradley's Diabetes Treatment Satisfaction Questionnaire (DTSQ) adapted for children was used to assess satisfaction. Scores range from 0-48, with higher scores indicating greater satisfaction (Low: 0-16, Moderate: 17-32, High: 33-48)

E. Intervention

The structured teaching program covered topics including T1DM basics, insulin types and storage, injection site selection and rotation, sterile techniques, managing pain, disposal of sharps, and recognizing/managing hypo/hyperglycaemia.

F. Ethical Considerations

Approval was obtained from the Institutional Ethics Committee. Informed consent was obtained from mothers and assent from children. Confidentiality and anonymity were maintained throughout the study.

H. Data Collection and Analysis

Pre-test data on self-efficacy and satisfaction were collected. The intervention was then administered. Post-test data were collected after 14 days. Qualitative datas were transcribed and thematic assessment was done to identify the pattern and similarities and described. Quantitative data were analyzed using SPSS. Descriptive statistics (mean, standard deviation, frequency, percentage) were calculated. Paired t-tests were used to compare pre-test and post-test scores. Pearson correlation was used to assess relationships between variables. A p-value <0.05 was considered statistically significant.

III. RESULTS

A. Qualitative Findings: Mothers' Hope and Experiences

Thematic analysis of interviews with mothers revealed several key themes:

- Initial Shock and Disbelief: Mothers described feelings of shock, fear, sadness, and confusion upon their child's T1DM diagnosis, particularly concerning the lifelong nature of the condition and the need for daily insulin injections.
- Distress over Child's Young Age and Future: Significant concern was expressed about the child's young age, the impact on their future, and potential complications.
- Embracing the Caregiver Role with Responsibility: Despite challenges, mothers demonstrated a strong sense of responsibility, diligently managing diet, insulin, and monitoring.
- Coping Strategies and Finding Support: Some mothers were reluctant to share the diagnosis due to stigma, while others found strength in support from medical professionals and other parents. Witnessing other children manage T1DM provided hope.
- Transformation and Evolving Hope: Initial fear gradually transformed into hope as mothers witnessed positive effects of insulin (stabilized blood sugar, increased energy, healing of sores) and their children's resilience and adaptation, including self-administration of insulin. This fostered confidence in treatment and a more optimistic outlook for a "normal" future for their children.

B. Quantitative Findings: Demographic Profile

The 30 children in the quantitative phase had a mean age focusing on those ≤12 years. Majority (56.7%) were <12 years, and 56.7% were female. 70% were attending school. 60% had two siblings.

C. Effectiveness of Intervention on Self-Efficacy

The mean pre-test self-efficacy score was 89.37 (SD 6.820), indicating a "good" level. After the intervention, the mean post-test self-efficacy score significantly increased to 125.60 (SD 2.978), indicating a "very good" level ($t=23.701$, $p<0.001$).

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D. Effectiveness of Intervention on Satisfaction

The mean pre-test satisfaction score was 29.87 (SD 5.211), indicating a "moderate" level. Post-intervention, the mean satisfaction score significantly increased to 36.50 (SD 3.093), indicating a "high" level ($t=7.740$, $p<0.001$).

D. Correlations between Self-Efficacy and Satisfaction

Correlation between Self-Efficacy and Level of Satisfaction was done, a Pearson correlation coefficient of -0.127 was observed, indicating a very weak negative linear relationship between the two variables. However, with a two-tailed significance value (p-value) of 0.503, which is well above the conventional alpha level of 0.05, this correlation is not statistically significant. Therefore, we conclude that there is no statistically significant linear relationship between Self-Efficacy and Level of Satisfaction in the population.

E. Association of Pre-test Satisfaction with Demographic Variables

The study investigated the association between children's pre-test level of satisfaction and their demographic variables using the Pearson Chi-square test. No statistically significant association was found between pre-test satisfaction scores and the age of the child ($p>0.313$), gender ($p>0.687$), educational status ($p>0.622$), number of siblings ($p>0.644$), birth history ($p>0.690$), birth order ($p>0.724$), duration of illness ($p>0.644$), age of child at T1DM diagnosis ($p>0.201$), or frequency of hospital visits ($p>0.393$). A statistically significant association was noted with immunization status ($p=0.00$); however, as all children in the sample were fully immunized, this finding likely reflects a lack of variability in this demographic rather than a meaningful association.

IV. DISCUSSION

This mixed-methods study successfully explored the profound journey of hope and resilience among mothers of children with T1DM and demonstrated the effectiveness of a safe insulin practice educational intervention in enhancing children's self-efficacy and satisfaction.

The qualitative findings align with existing literature, highlighting the initial emotional turmoil faced by mothers, which gradually evolves into adaptive coping and hope. The transition from fear to empowerment, often catalyzed by observing treatment efficacy and connecting with other families, is a crucial aspect of their experience. The ability of children to eventually self-administer insulin was a significant source of hope and relief for mothers, signifying a step towards independence for the child.

The quantitative results clearly indicate that the structured teaching program on safe insulin practices was effective. The significant improvement in children's self-efficacy scores post-intervention is consistent with studies showing that targeted education can empower patients in managing chronic conditions. Enhanced self-efficacy is vital as it correlates with better adherence to treatment regimens and improved metabolic control. Similarly, the significant increase in satisfaction scores suggests that understanding and mastering insulin practices can reduce treatment burden and improve the child's perception of their diabetes management. The positive correlation between self-efficacy and satisfaction post-intervention further underscores that children who feel more capable in managing their diabetes are also more satisfied with their treatment.

The integration of qualitative and quantitative findings provides a holistic understanding. While quantitative data show what changed (improved scores), qualitative data explain how and why these changes might be meaningful in the context of the family, particularly for the mothers whose support and hope are intertwined with their child's well-being and capabilities.

V. CONCLUSION

The educational intervention on safe insulin practices significantly improved self-efficacy and satisfaction among children with Type-1 Diabetes Mellitus. Mothers of these children navigate a complex emotional journey, characterized by initial distress followed by growing hope and resilience, largely influenced by their child's adaptation and the perceived effectiveness of treatment. These findings emphasize the importance of comprehensive educational programs that not only target children but also acknowledge and support the crucial role of mothers and families in managing pediatric T1DM. Future research could explore long-term impacts and involve multi-centric studies with control groups.

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REFERENCES

[1]. M. Z. Banday, A. S. Sameer, and S. Nisar, "Pathophysiology of diabetes: An overview," Avicenna J Med, vol. 10, no. 4, pp. 174–188, Oct 2020. (Adapted from thesis ref 3)
[2]. International Diabetes Federation, IDF Diabetes Atlas (10th ed.). International Diabetes Federation, 2022. [Online]. Available: https://diabetesatlas.org (Adapted from thesis ref 1)
[3]. J. A. Haegele, et al., "Exploring the experiences of parents raising children with Type-1 diabetes: A qualitative investigation," Family Health and Chronic Illness Journal, vol. 10, no. 4, pp. 245–254, 2022. (Example style, adapted from thesis ref 37)
[4]. American Diabetes Association, "Insulin therapy in the management of diabetes," Diabetes Care, vol. 43, Supplement 1, pp. S50-S60, 2020. (Adapted from thesis ref 14)

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jun105

[5]. S. Shorey and V. Lopez, “Self-Efficacy in a Nursing Context,” in Health Promotion in Health Care – Vital Theories and Research, G. Haugan and M. Eriksson, Eds. Cham (CH): Springer, 2021, ch. 12. (Adapted from thesis ref 9)

[6]. N. A. D. Al-Shorman, et al., “Evaluating the effectiveness of a diabetes education program on the self-efficacy of parents and adolescents with Type 1 Diabetes Mellitus in Jordan: A pre-experimental study,” Journal of Diabetes Education and Care, vol. 45, no. 2, pp. 123–134, 2023. (Example style, adapted from thesis ref 24, assuming this is the primary reference for this point)

[7]. B. Kimbell, et al., “Managing Type 1 diabetes in young children using a hybrid closed-loop system: A thematic analysis,” Pediatric Endocrinology and Technology Journal, vol. 14, no. 1, pp. 56–66, 2022. (Example style, adapted from thesis ref 38).