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Commentary Article

Association of Self-Efficacy, Resiliency, and Attachment Style in a Type 1 Pediatric Diabetes Clinic: Perspectives in Practice

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Abstract

This study explored the interconnected roles of self-efficacy, resilience, and attachment styles in the management of type 1 diabetes mellitus (T1DM) among adolescents and their caregivers. Despite the criticality of diabetes education, behaviour change remains inconsistent, underlining the importance of integrating psychosocial components into care regimens. The research specifically investigated the potential correlation between these psychosocial factors and A1c levels, aiming to find strategies to enhance patient and caregiver adherence to diabetes self-care.

Using a cross-sectional design, 170 patients and their primary caregivers from the Hospital for Sick Children (SickKids) participated. While no direct association was identified between attachment styles and A1c levels, a significant negative correlation was noted between the preoccupied attachment style and self-efficacy. This emphasizes the potential influence of attachment styles on diabetes management outcomes. The findings underscore the necessity for diabetes care specialists to consider these psychosocial dynamics in care delivery, promoting a more comprehensive, patient-focused approach to diabetes management. Future research should prioritize diverse participant demographics and employ updated assessment tools to offer broader insights.

Keywords: Self-Efficacy; Resilience; Attachment style; Type 1 Diabetes; Adolescents; Glycemic control

Key Messages

1. Attachment styles potentially influence self-efficacy in diabetes management.

2. Preoccupied attachment style, marked by emotional dependence, prevails in the study group.

3. Addressing psychosocial aspects can enhance type 1 diabetes management strategies.

Introduction

Type 1 diabetes mellitus (T1DM) [1] is a prevalent pediatric disease requiring comprehensive self-care behaviours to mitigate long-term complications [4,7,18-20]. Optimal management faces obstacles from developmental stages [10-17], family dynamics, and the shifts accompanying adolescence.

These elements may hinder adherence to self-care practices, inducing metabolic discrepancies and familial conflicts [10,15,24-30].

Diabetes education, while essential [31], does not consistently induce behaviour change, highlighting the value of integrating psychosocial concepts, specifically self-efficacy [1,12,33-36] and attachment style. Attachment theory postulates that distress activates the attachment system, affecting adolescents' coping and healthcare approaches [113]. Caregiver attachment styles, too, play a role in adapting to a child's diabetes diagnosis, with certain patterns correlating with increased parental stress [30, 52,82,84].

This study delves into the relationships between self-efficacy, resilience, attachment theory, and A1c levels, seeking strategies to bolster patient and caregiver commitment to self-care. Incorporating psychological elements into diabetes care allows for the creation of targeted interventions, enhancing patient outcomes. This article guides diabetes care specialists, proposing strategies to augment patient engagement and refine care approaches.

This Perspective in Practice piece introduces innovative methodologies in diabetes care and education, rooted in the intersections of self-efficacy, resilience, attachment, and A1c levels. A holistic, patient-focused approach is endorsed over traditional didactic methods.

Literature Review:

Attachment theory provides a framework for understanding the drive to form relationships rooted in early-life caregiver interactions [46]. Four styles-secure, dismissing, preoccupied, and fearful- determine perceptions of oneself and others [56]. Notably, a dismissing style, having a positive self-view and negative views of others, correlates with higher A1c levels [52,59]. Thus, this study emphasizes secure and dismissing styles, merging the preoccupied and fearful groups.

Resiliency theory addresses coping during adversity, often equated with strength [74,75]. While secure attachment in caregivers aids adaptation to their child's diabetes [30], avoidant attachment correlates with increased parental stress [82,84]. The data indicates the need for resilience-focused interventions for adolescents with type 1 diabetes [74,75]. This research expects a connection between self-efficacy, attachment, and resilience influencing adolescent diabetes management [30,52].

Method

The objective of this study was to evaluate diabetes management self-efficacy in type 1 diabetes patients, parental perceptions of their children's self-efficacy, the attachment style between teenagers and their parents, and the level of resilience in children with diabetes. The primary focus was to investigate the impact of the three attachment styles (secure, mixed, and scared) on type 1 diabetes management, as assessed by A1C levels. The secondary goal was to examine the effects of attachment styles on both patients and parents' self-efficacy and compare diabetes management self-efficacy and attachment styles between patients and their parents.

Participants

This cross-sectional pilot study involved 170 patients with type 1 diabetes and their primary caregivers. The participants were recruited from the Hospital for Sick Children (SickKids), where approximately 1000 patients within the age range of 0-17.9 years receive diabetes care. Among these patients, 60% (660) fall within the inclusion age range of 12.0-17.9 years. The study included a diverse population in terms of race and socioeconomic status, with patients attending diabetes clinics regularly (every three months). Approximately 60-80 patients attend the clinic each week, and the study aimed to recruit 4-5 patients per week, requiring approximately 6-8 months to reach the target of 170 patients and their primary caregivers. Exclusion criteria included non-English-speaking families, recent diabetes diagnosis (less than a year), medication induced diabetes, type 2 diabetes, or cystic fibrosis-related diabetes.

Procedure

The participants completed several questionnaires: the Self Efficacy for Diabetes Scale (SEDM), the Self Care Inventory (SCI), and the Relationship Scales Questionnaire (RSQ). The questionnaire took approximately 15 to 20 minutes to complete, while the entire study visit (consent and questionnaire) lasted about 20 to 25 minutes. Additionally, each participant was assigned a study

identification number and required to submit Case Report Forms (CRF) containing relevant data, including:

- Study identification number
- Full name
- Date of birth or age
- Gender
- Recent/last HbA1c
- Ethnicity (to consider potential effects of different ethnicities on attachment style)
- Parental education level (to consider the role of parents in helping their children with diabetes
- Management based on their understanding and learning)
- Income and marital status
- Duration of diabetes
- Age of diagnosis
- Method of insulin administration (e.g., 2 times a day, 3 times a day-TID, pump, multiple daily injections- MDI)

Measures

Self-Efficacy of Diabetes Self-Management (SEDM)

The SEDM is a 10-item questionnaire that assesses perceived self-efficacy in performing diabetes care behaviours. Participants rate their responses on a Likert scale ranging from 1 ("not at all sure") to 10 ("completely sure"). The SEDM has been used for convergent validation of other tools, such as the Perceived Coping Effectiveness measure and the Adherence in Diabetes Questionnaire [85,86,94,95,96].

Self-Care Inventory (SCI)

The SCI is a 14-item self-report scale that assesses patients' perceptions of their adherence to diabetes self-care over the previous 1-2 weeks. Participants rank how closely each item resonates with them on a 5-point Likert scale, ranging from 1 ("never do it") to 5 ("always do this as recommended without fail"). The scale explores various areas of adherence to diabetes management, including blood sugar monitoring, insulin injections, diet, and activity [97,98,99]. The SCI scores of both youth and parents have shown negative correlations with the adolescent's A1c levels [98].

Relationship Scales Questionnaire (RSQ)

The RSQ is a 30-item questionnaire measures attachment style and is considered valid and reliable. Re-test reliability of the RSQ ranges from 0.54 to 0.78, and correlation coefficients between the RSQ and RQ range from 0.41 to 0.61 [57,76].

Adolescent Relationship Scale Questionnaire (A-RSQ)

The A-RSQ, with reported validity of 0.7-0.95 and internal consistency of 0.82, was used to assess attachment style in adolescents. It has been used in studies involving adolescents aged 11-16 years and 12-17 years [103-105].

Diabetes Strengths and Resilience Measure for Adolescents (DSTAR-Teen)

The DSTAR-Teen is a 12-item self-report questionnaire that assesses adolescents' diabetes strengths and resilience. It was administered to participants based on their age group (9-13 or 1418 years). The questionnaire measures adolescents' perceptions of their competence in managing diabetes routines, flexibility in dealing with diabetes-related unforeseen circumstances, and seeking help with diabetes issues [102]. Participants rate each item on a 5-point Likert scale, ranging from 1 ("never") to 5 ("almost usually"). The DSTAR-Teen has demonstrated strong internal consistency (Cronbach's alpha of 0.89) [10].

By employing these measures, the study aimed to explore the relationship between self-efficacy, attachment style, and resilience in diabetes management among patients and their parents. The data collected through the questionnaires and CRFs provided valuable insights into the psychosocial factors influencing diabetes care and education, enabling the development of innovative approaches to enhance patient engagement and improve overall diabetes care delivery.

Results

This investigation aimed to discern the influence of disparate attachment styles on glycated hemoglobin (HbA1c) levels among individuals living with type 1 diabetes mellitus (T1DM) while adjusting for a myriad of demographic and clinical variables. The data analysis utilized an Analysis of Variance (ANOVA) model, an instrumental statistical methodology that facilitates the comparison of means across multiple groups to identify significant disparities. This robust model enabled the elucidation of potential correlations between attachment styles and HbA1c levels.

Descriptive statistics encapsulating patient demographics, clinical variables, and self-report instrument data are comprehensively delineated in Table 1 (refer to appendix). Continuous variables, namely age and HbA1c levels, are presented as Mean ± Standard Deviation (SD) and range. The average age of the participating adolescents was 14 years, and for the caregivers, it was 48 years. Pertaining to gender, a majority of both adolescents (56%) and caregivers (73.8%) were male, with 52.8% of the adolescent

participants identifying as Caucasian.

Upon analysis of HbA1c levels and adolescent attachment styles, no statistically significant association was detected, as evinced by p-values exceeding the standard 0.05 threshold (Figure A – refer to appendix). However, the data displayed a positive skew for A1c levels due to an outlying value of 14.00, necessitating a cautious interpretation of these results.

Intriguingly, the study unveiled a negative correlation between the preoccupied attachment style and self-efficacy. This significant finding accentuates the potential impact of attachment styles on self-efficacy levels and, subsequently, diabetes management outcomes.

In conclusion, these findings underscore the essentiality of considering attachment styles when providing care for individuals with diabetes. These results underscore the potential for psychological factors such as attachment styles to influence self-efficacy and health outcomes in a diabetic population. This study thus contributes to an enriched understanding of the psychosocial facets of diabetes management, highlighting the necessity for further research and practical implementation in this domain. The perspectives outlined here offer a compelling case for the integration of attachment style considerations in the formulation of patient care plans, potentially fortifying self-efficacy and augmenting overall diabetes management outcomes [106-117].

Category	Data/Results
Study Objective	Determine the influence of attachment styles on HbA1c levels in T1DM patients
Analysis Method	Analysis of Variance (ANOVA)
Patient Demographics	Average age (adolescents): 14 years Average age (caregivers): 48 years
Gender Distribution	Adolescents: 56% male Caregivers: 73.8% male
Ethnicity (Adolescents)	53.8% Caucasian
HbA1c Levels Analysis	No significant association between HbA1c levels and adolescents attachment styles
Data Skew	Positive skew due to outlier value of 14.00 in A1c levels
Key Finding	Negative correlation between preoccupied attachment style and self-efficacy
Implications	Psychological factors, especially attachment styles can impact self-efficacy and diabetes management outcomes. Further research and practical application is needed.

Table1: Descriptive statistics encapsulating patient demographics.

Discussion

This investigation provides insight into the relationship between attachment style, self-efficacy, resilience, and glycemic control (measured via A1c levels) in adolescent diabetes patients and their caregivers. However, the findings did not corroborate the primary hypothesis of a clear association between attachment styles and A1c levels.

Despite the absence of a significant correlation between the examined attachment styles (preoccupied, dismissive, and fearful) and A1c levels, a notable negative correlation was found between the preoccupied attachment style and self-efficacy levels, as gauged by the SCI and DSTAR scales.

Many participants exhibited a preoccupied attachment style. This style, marked by negative self-perception and emotional dependence on others, indicates that adolescents with diabetes may rely on their caregivers for support and management, highlighting the need for specific psychosocial interventions.

Potential limitations include the study's cross-sectional design and the predominantly Caucasian participant demographic, which may restrict the generalizability of the findings. Future research should prioritize diversity in participant selection.

Utilizing newer instruments like the IPPA might also enhance more accurate assessments in future studies, deepening understanding of the relationship between attachment styles and glycemic control.

In conclusion, this study emphasizes the importance of further exploration into the psychosocial aspects of diabetes management. Advancements in research methods and tools, coupled with diverse participant selection and longitudinal designs, could guide interventions, enhance understanding of the link between psychosocial factors and diabetes outcomes, and promote better diabetes care practices.

Conclusion

This study examined the complex interplay of self-efficacy, resilience, and attachment styles among adolescents with type 1 diabetes and their caregivers. While no significant correlation was found among these variables, the predominance of the preoccupied attachment style is noteworthy, as it suggests a strong emotional reliance on caregivers for diabetes management.

Given the constraints of cross-sectional design and participant cultural uniformity, the study contributes valuable insights into the psychological aspects of diabetes management. Future research should employ up-to-date tools and longitudinal designs and ensure cultural diversity in study populations for more comprehensive findings.

Practically, the study underscores the importance for diabetes care providers to recognize the potential influence of psychosocial factors. This could pave the way for personalized, effective strategies for diabetes education and management, considering both physical and psychological aspects of patient well-being.

Author Disclosures

The authors declare no conflicts of interest.

References

1. Wherrett D, Huot C, Mitchell, B, Pacaud D (2013) Type 1 diabetes in children and adolescents. Canadian Journal of Diabetes. 37: S153-S162.
2. The Diabetes Control and Complications Trial (DCCT) (1993) Research Group the effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. N Engl J 329: 977-986.
3. Guo J, Whittemore R, He G-P (2011) The Relationship between diabetes self-management and metabolic control in youth with type 1 diabetes: an integrative review. Journal of Advanced Nursing. 67: 2294-2310.
4. Funnell MM, Anderson RM (2004) Empowerment and Self–Management of Diabetes. Clinical Diabetes. 22: 123-127.
5. Beckerle CM, Lavin MA (2013) Association of self-efficacy and self-care with glycemic control in diabetes. Diabetes Spectrum. 26: 172-178.
6. Hackworth NJ, Hamilton VE, Moore SM, Northam EA, Bucalo Z, et al. (2013) Predictors of diabetes Self-care, metabolic control, and mental health in youth with type 1 diabetes. Australian Psychologist. 48: 360-369.
7. Schneider S, Iannotti R, Nansel T, Haynie D, Simons-Morton b, et al. (2007) Identification of Distinct Self-Management Styles of Adolescents with Type 1 Diabetes. Diabetes Care. 30: 1107- 1112.
8. AADE. AADE7 self-care behaviours: Measureable behaviour change is the desired outcome of diabetes education.
9. Edmunds S, Roche D, Stratton G, Wallymahmed K, Glenn SM (2007) Physical activity andpsychological well-being in children with Type 1 diabetes. Psychol Health Med. 12: 353-363.
10. Berg CA, King PS, Butler JM, Pham P, Palmer D, et al. (2011) Parental involvement and adolescents' diabetes management: the mediating role of self-efficacy and externalizing and internalizing behaviours. J Pediatr Psychol 36: 329-339.
11. Urbach SL, LaFranchi S, Lambert L, Lapidus JA, Daneman D, et al. (2005) Predictors of glucose control in children and adolescents with type 1 diabetes mellitus. Pediatr Diabetes. 6: 69-74.
12. Hood KK, Rohan JM, Peterson CM, Drotar D (2010) Interventions with adherence-promoting components in pediatric type 1 diabetes: meta-analysis of their impact on glycemic control. Diabetes Care. 33: 1658-1664.
13. Wysocki T, Nansel TR, Holmbeck GN, et al. (2009) Collaborative involvement of primary and secondary caregivers: associations with youths' diabetes outcomes. J Pediatr Psychol 34: 869-881.
14. Chiu HJ (2005) A test of the Bruhn and Parcel Model of Health Promotion. J Nurs Res 13: 184-196.
15. Law GU, Walsh J, Queralt V, Nouwen A (2013) Adolescent and parent diabetes distress in type 1diabetes: the role of self-efficacy, perceived consequences, family responsibility and adolescent parent discrepancies. J Psychosom Res 74: 334-339.
16. Sander EP, Odell S, Hood KK (2010) Diabetes-specific family conflict and blood glucose monitoring in adolescents with type 1 diabetes: Mediational role of diabetes self-efficacy. Diabetes Spectrum. 23: 89-94.
17. Wysocki T, Greco P (2006) Social support and diabetes management in childhood and adolescence: influence of parents and friends. Curr Diab Rep. 6: 117-122.
18. Nouwen A, Urquhart Law G, Hussain S, McGovern S, Napier H (2009) Comparison of the role of self-efficacy and illness presentations in relation to dietary self-care and diabetes distress in adolescents with type 1 diabetes. Psychol Health 24: 1071-1084.
19. APA. A reference for professionals: Developing adolescents. 2002
20. Battaglia MR, Alemzadeh R, Katte H, Hall PL, Perlmuter LC (2006) Brief report: disordered eating and psychosocial factors in adolescent females with type 1 diabetes mellitus. J Pediatr Psychol. 31: 552-556.
21. Rotheram-Borus MJ, Ingram BL, Swendeman D, Lee A (2012) Adoption of Self-Management Interventions for Prevention and Care. Primary Care. 39: 649-660.
22. Bandura A (2004) Health promotion by social cognitive means. Health Educ Behav. 31: 143-164.
23. Stokols D (1996) Translating social ecological theory into guidelines for community health promotion. Am J Health Promot 10: 282-298.
24. Noser AE, Patton SR, Van Allen J, Nelson MB, Clements MA (2017)

Evaluating Parents' Self-Efficacy for Diabetes Management in Pediatric Type 1 Diabetes. J Pediatr Psychol 42: 296-303.

25. Berg CA, Butner JE, Butler JM, King PS, Hughes AE, et al. (2013) Parental persuasive strategies in the face of daily problems in adolescent type 1 diabetes management. Health Psychol 32: 719-728.
26. Holmes CS, Chen R, Streisand R, Souter S, Swift EE, et al. (2006) Predictors of youth diabetes care behaviours and metabolic control: a structural equation modeling approach. J Pediatr Psychol 31: 770-784.
27. Kaugars AS, Kichler JC, Alemzadeh R (2011) Assessing readiness to change the balance of responsibility for managing type 1 diabetes mellitus: adolescent, mother, and father perspectives. Pediatr Diabetes. 12: 547-555.
28. Hanna KM, Weaver MT, Stump TE, Dimeglio LA, Miller AR, et al. (2011) Initial findings: primary diabetes care responsibility among emerging adults with type 1 diabetes post high school and move out of parental home. Child Care Health Dev 39: 61-68.
29. Hanna KM, Weaver MT, Stump TE, Slaven JE, Fortenberry JD, et al. (2013) Readiness for living independently among emerging adults with type 1 diabetes. Diabetes Educ 39: 92-99.
30. Allen JP, Hauser ST (1996) Autonomy and relatedness in adolescent-family interactions as predictors of young adults' states of mind regarding attachment. Development and Psychopathology. 8: 793-809.
31. Jones H, Berard LD, MacNeill G, Whitham D, Yu C (2013) Self-management education. Canadian Journal of Diabetes. 37: S26-S30.
32. Heisler M, Piette JD, Spencer M, Kieffer E, Vijan S (2005) The relationship between knowledge of recent HbA1c values and diabetes care understanding and self-management. Diabetes Care. 28: 816-822.
33. Whittemore R, Knafl K (2005) The integrative review: updated methodology. J Adv Nurs 52: 546-553.
34. Fisher KL (2006) School nurses' perceptions of self-efficacy in providing diabetes care. J Sch Nurs 22: 223-228.
35. Sullivan-Bolyai S, Crawford S, Johnson K, Huston B, Lee MM (2012) Educating diabetes camp counselors with a human patient simulator: a pilot study. Journal for specialists in pediatric nursing. 17: 121-128.
36. Streisand R, Mackey ER, Elliot BM, Mesnick L, Slaughter IM, et al. (2008) Parental anxiety and depression associated with caring for a child newly diagnosed with type 1 diabetes: opportunities for education and counseling. Patient Educ Couns 73: 333-338.
37. Shortridge-Baggett LM (2001) Self-efficacy: Measurement and intervention in nursing. Scholarly Inquiry for Nursing Practice: An International Journal. 15: 46-56
38. Ciechanowski PS, Russo J, Katon WJ, Lin EH, Ludman E, et al. (2010) Relationship Styles and Mortality in Patients with Diabetes. Diabetes Care. 33: 539-544.
39. Abubakari A-R, Cousins R, Thomas C, Sharma D, Naderali EK (2016) Sociodemographic and Clinical Predictors of Self-Management among People with Poorly Controlled Type 1 and Type 2 Diabetes: The Role of Illness Perceptions and Self-Efficacy. Journal of Diabetes Research. 6708164-6708164.
40. Gillibrand R, Stevenson J (2006) The extended health belief model applied to the experience of diabetes in young people. Br JHealth Psychol 11: 155-169.
41. Senecal C, Nouwen A, White D (2000) Motivation and dietary self-care in adults with diabetes: are self-efficacy and autonomous self-regulation complementary or competing constructs? Health Psychol 19: 452-457.
42. Bandura A (1977) Self-efficacy: toward a unifying theory of behavioural change. Psychol Rev 84: 191-215.
43. Grossman HY, Brink S, Hauser ST (1987) Self-efficacy in adolescent girls and boys with insulin dependent diabetes mellitus. Diabetes Care. 10: 324329.
44. Benight CC, Bandura A (2004) Social cognitive theory of posttraumatic recovery: the role of perceived self-efficacy. Behav Res Ther 42: 1129-1148.
45. Peyrot M, Rubin RR (2007) behavioural and Psychosocial Interventions in Diabetes: a conceptual review. Diabetes Care. 30: 2433-2440.
46. Bowlby J (1977) The making and breaking of affectional bonds. British Journal of Psychiatry. 130: 201-210.
47. Stupiansky NW, Hanna KM, Slaven JE, Weaver MT, Fortenberry JD (2013) Impulse control, diabetes specific self-efficacy, and diabetes management among emerging adults with type 1 diabetes. J Pediatr Psychol 38: 247-254.
48. Stewart SM, Lee PW, Waller D, Hughes CW, Low LCK, et al. (2003) A follow-up study of adherence and glycemic control among Hong Kong youths with diabetes. J Pediatr Psychol 28: 67-79.
49. Faulkner MS, Michaliszyn SF, Hepworth JT (2010) A personalized approach to exercise promotion in adolescents with type 1 diabetes. Pediatr diabetes. 11: 166-174.
50. Kichler JC, Kaugars AS, Ellis J, Alemzadeh R (2010) Exploring self-management characteristics in youths with type 1 diabetes mellitus: does membership in a glycemic control category matter? Pediatr Diabetes. 11:536-543.
51. Austin S, Senecal C, Guay F, Nouwen A (2011) Effects of gender, age, and diabetes duration on dietary self-care in adolescents with type 1 diabetes: a Self-Determination Theory perspective. J Health psychol 16: 917-928.
52. Ciechanowski PS, Katon WJ, Russo JE, Walker EA (2001) The PatientProvider Relationship: Attachment Theory and Adherence to Treatment in Diabetes. American Journal of Psychiatry. 158: 29-35.
53. CDC. (2011) National diabetes fact sheet: National estimates and general information on diabetes and prediabetes in the United States.
54. Levine BS, Anderson BJ, Butler DA, Antisdel JE, Brackett J, et al. (2001) Predictors of glycemic control and short-term adverse outcomes in youth with type 1 diabetes. J Pediatr. 139: 197-203.
55. CDC. Children and diabetes: SEARCH for diabetes in youth. (2013).
56. Bartholomew K, Horowitz LM (1991) Attachment styles among young adults: A test of a four-category model. Journal of Personality and Social Psychology. 61: 226-244.
57. Daneman D, DanemanM (2012) What has attachment theory got to do with diabetes care?. Diabetes Management. 2: 85-87.

58. Dale WG, Kim B (1994) The metaphysics of measurement: the case of adult attachment. Adv Pers Rel 5: 17-52,

59. Ciechanowski PS, Hirsch IB, Katon WJ (2002) Interpersonal Predictors of HbA1c in Patients with Type 1 Diabetes. Diabetes Care. 25: 731-736.

60. Merkel RM, Wright T (2012) Parental self-efficacy and online support among parents of children diagnosed with type 1 diabetes mellitus. Pediatr Nurs 38: 303-308.

61. Whittemore R, Jaser SS, Jeon S, Liberti L, Delameter A, et al. (2012) An internet coping skills training program for youth with type 1 diabetes: six-month outcomes. Nurs Res 61: 395-404.

62. Lorig K, Ritter PL, Villa FJ, Armas J (2009) Community-based peer-led diabetes self-management: a randomized trial. Diabetes Educ 35: 641-651.

63. Konicki CD (2005) Measurement in health behaviour. San Francisco, CA: Jossey-Bass. A Wiley Imprint.

64. Kowalski AJ (2009) Can we really close the loop and how soon? Accelerating the availability of an artificial pancreas: a roadmap to better diabetes outcomes. Diabetes Technol Ther 11: S113-S119.

65. Pender NJ, Bar-Or O, Wilk B, Mitchell S (2002) Self-efficacy and perceived exertion of girls during exercise. Nurs Res. 51: 86-91.

66. Jeannette MR, Maria IJ-C (2006) Cognitive-behavioural group therapy for depression in adolescents with diabetes: a pilot study. Interramerican Journal of Psychology. 40: 219-226.

67. Grey M, Whittemore R, Jaser S, et al. (2009) Effects of coping skills training in school-age children with type 1 diabetes. Res Nurs Health 32: 405-418.

68. Marvicsin D (2008) School-age children with diabetes: role of maternal self-efficacy, environment, and management behaviours. Diabetes Educ 34: 477-483.

69. Winsett RP, Stender SR, Gower G, Burghen GA (2010) Adolescent self-efficacy and resilience in participants attending A diabetes camp. Pediatr Nurs 36: 293-296.

70. Ambrosino JM, Fennie K, Whittemore R, Jaser S, Dowd MF, et al. (2008) Short-term effects of coping skills training in school-age children with type 1 diabetes. Pediatr diabetes. 9: 74-82.

71. Littlefield CH, Craven JL, Rodin GM, Daneman D, Murray MA, et al. (1992) Relationship of self-efficacy and binging to adherence to diabetes regimen among adolescents. Diabetes Care. 15: 90-94.

72. Chih AH, Jan CF, Shu SG, Lue BH (2010) Self-efficacy affects blood sugar control among adolescents with type I diabetes mellitus. J Formos Med Assoc 109: 503-510.

73. Hughes AE, Berg CA, Wiebe DJ (2012) Emotional processing and self-control in adolescents with type 1 diabetes. J Pediatr Psychol. 37: 925-934.

74. Hilliard ME, Harris MA, Weissberg-Benchell J (2012) Diabetes resilience: A model of risk and protection in type 1 diabetes. Current Diabetes Reports. 12: 739-748.

75. Yi-Frazier JP, Yaptangco M, Semana S, Buscaino E, Thompson V, et al. (2015) The association of personal resilience with stress, coping, and diabetes outcomes in adolescents with type 1 diabetes: Variable- and person focused approaches. Journal of Health Psychology. 20: 1196-1206.

76. Karreman A, Vingerhoets AJJM (2012) Attachment and well-being: The mediating role of emotion regulation and resilience. Personality and Individual Differences. 53: 821-826.

77. Gerber AJ (2007-2006) Attachment, resilience, and psychoanalysis commentary on hauser and allen's "overcoming adversity in adolescence". Psychoanalytic Inquiry. 26: 585-594.

78. Jaser SS, White LE (2011) Coping and resilience in adolescents with type 1 diabetes. Child: Care, Health and Development. 37: 335-342.

79. McMahon SK, Airey FL, Marangou DA, McElwee DA, Carne CL, et al. (2004) Insulin pump therapy in children and adolescents: improvements in key parameters of diabetes management including quality of life. Diabet Med 22: 92-96.

80. Leonard BJ, Skay CL, Rheinberger MM (1998) Self-management development in children and adolescents with diabetes: the role of maternal self-efficacy and conflict. J Pediatr Nurs 13: 224-233.

81. Butler JM, Skinner M, Gelfand D, Berg CA, Wiebe DJ (2007) Maternal parenting style and adjustment in adolescents with type I diabetes. J Pediatr Psychol 32: 1227-1237.

82. Streisand R, Swift E, Wickmark T, Chen R, Holmes CS (2005) Pediatric parenting stress among parents of children with type 1 diabetes: the role of self-efficacy, responsibility, and fear. J Pediatr Psychol 30: 513-521.

83. Rohan JM, Huang B, Pendley JS, Delamater A, Dolan L, et al. (2015) Predicting health resilience in pediatric type 1 diabetes: A test of the resilience model framework. Journal of Pediatric Psychology. 40: 956-967.

84. Moreira H, Canavarro MC (2016) Parental attachment insecurity and parenting stress: The mediating role of parents' perceived impact of children's diabetes on the family. Families, Systems & Health. 34: 240-249.

85. Iannotti RJ, Schneider S, Nansel TR, Haynie DL, Plotnick LPet al. (2006) Self-efficacy, outcome expectations, and diabetes selfmanagement in adolescents with type 1 diabetes. J Dev Behav Pediatr 27: 98-105.

86. Schilling LS, Dixon JK, Knafl KA, Lynn MR, Mourphy K, et al. (2009) A new self-report measure of self-management of type 1 diabetes for adolescents. Nurs Res 58: 228-236.

87. DeVon HA, Block ME, Moyle-Wright P, Ernst DM, Hayden SJ, et al. (2007) A psychometric toolbox for testing validity and reliability. J Nurs Scholarsh. 39: 155-164.

88. Herge WM, Streisand R, Chen R, Holmes C, Kumar A, et al. (2012) Family and youth factors associated with health beliefs and health outcomes in youth with type 1 diabetes. J Pediatr Psychol 37: 980-989.

89. Palmer DL, Berg CA, Butler J, Fortenberry K, Murray M, et al. (2009) Mothers', fathers', and children's perceptions of parental diabetes responsibility in adolescence: examining the roles of age, pubertal status, and efficacy. JPediatr Psychol 34: 195-204.

90. Croom A, Wiebe DJ, Berg CA, Lindsay R, Donaldson D, et al. (2011) Adolescent and parent perceptions of patientcentered communication while managing type 1 diabetes. J Pediatr Psychol 36: 206-215.

91. University of Michigan (2013) Michigan Diabetes Research and Training Center: Survey instruments.

92. Anderson RM, Funnell MM, Fitzgerald JT, Marrero DG (2000) The Diabetes Empowerment Scale: a measure of psychosocial self-efficacy. Diabetes Care. 23: 739-743.

93. DeVellis RF (2012) Scale development theory and applications. 3rd ed. Los Angeles, CA: Sage.

94. Streiner DL (2003) Starting at the beginning: an introduction to coefficient alpha and internal consistency. J Pers Assess 80: 99-103.

95. Berg CA, Skinner M, Ko K, et al. (2009) The fit between stress appraisal and dyadic coping in understanding perceived coping effectiveness for adolescents with type 1 diabetes. J Fam Psychol 23: 521-530.

96. Butler JM, Berg CA, King P, Gelfand D, Fortenberry K, et al. (2009) Parental negative affect and adolescent efficacy for diabetes management. J Fam Psychol 23: 611-614.

97. Kristensen LJ, Thastum M, Mose AH, Birkebaek NH (2012) Psychometric evaluation of the adherence in diabetes questionnaire. Diabetes Care. 35: 2161-2166.

98. La Greca AM, Swales T, Klemp S, Madigan S (1988) Self-care behaviours among adolescents with diabetes. Proceedings of the Ninth Annual Sessions of the Society of behavioural Medicine, Boston, A42.

99. Lewin AB, LaGreca AM, Geffken GR, Williams LB, Duke DC, et al. (2009) Validity and reliability of an adolescent and parent rating scale of Type 1 Diabetes Adherence Behaviours: The Self-Care Inventory (SCI). Journal of Pediatric Psychology. 34: 999-1007.

100. Wallston KA, Rothman RL, Cherrington A (2007) Psychometric properties of the Perceived Diabetes Self-Management Scale (PDSMS). J Behav Med 30: 395-401.

101. Korbel CD, Wiebe DJ, Berg CA, Palmer DL (2007) Gender differences in adherence to type 1 diabetes management across adolescence: The mediating role of depression. Children's Health Care. 36: 83-98.

102. Armstrong B, Mackey ER, Streisand R (2011) Parenting behaviour, child functioning, and health behaviours in preadolescents with type 1 diabetes. J Pediatr Psychol 36: 1052-1061.

103. Hilliard M, Iturralde E, Weissberg-Benchell, Hood KK (2017) The Diabetes Strengths and Resilience Measure for Adolescents With Type 1 Diabetes (DSTAR-Teen): Validation of a New, Brief Self-Report Measure. Journal of Pedatric Psychology. 42: 955-1005.

104. Sümer N, Güngör D (1999) Psychometric evaluation of adult attachment measures on Turkish Samples and a crosscultural comparison. Turkish Journal of Psychology. 14: 71-109.

105. Keskin G, Çam, O (2010) Adolescents' strengths and difficulties: approach to attachment styles. Journal of Psychiatric and Mental Health Nursing. 17: 433-441.

106. Erkan M, Gencoglan S, Akguc L, Ozatalay E, Fettahoglu CE (2015) Attachment styles and psychopathology among adolescent children of parents with bipolar disorders. Med Sci Monit 21: 1083-1088.

107. Monaghan M, Clary L, Stern A, Hilliard ME, Streisand R (2015) Protective Factors in Young Children with Type 1 Diabetes. Journal of Pediatric Psychology. 40: 878-887.

108. Waltz CF, Strickland OL, Lenz ER (2010) Measurement in nursing and health research. 4th Ed. New York: Springer.

109. Mikulincer M, Shaver PR (2007) Attachment in adulthood: Structure, dynamics, and change. New York: Guilford Press.

110. Rasbach L, Jenkins C. Laffel L (2014) An Integrative Review of Self-Efficacy Measurement Instruments in Youth with Type 1 Diabetes. The Diabetes Educator. 41: 43-58.

111. Schulz KF, Altman DG, Moher D (2010) CONSORT 2010 statement: updated guidelines for reporting parallel group randomised trials. BMJ 340: c332.

112. CEBM. Oxford centre for evidence-based medicine: Levels of evidence. 2009.

113. Redding CA, Maddock JE, Rossi JS (2006) The sequential approach to measurement of health behaviour constructs: Issues in selecting and developing measures. Californian J Health Promot 4: 83-101.

114. Shayeghian Z, Moeineslam M, Hajati E, Karimi M, Amirshekari G, et al. (2020) The relation of alexithymia and attachment with type 1 diabetes management in adolescents: a gender-specific analysis. BMC psychology. 8: 30.

115. Nosrati MS, Ali Mazaheri M, Heydari M (2006) The relationship between identity status and degree of attachment in male adolescents (aged 14, 16 & 18) in Kamyaran: a developmental study. J Fam Res 2: 35-53.

116. Hejazi E, EJei J, Ranjbar G (2013) Predicting school connectedness based on parent and peers attachment. J Fam Res 9: 83-97.

117. Biabani Aliabad H, Asadi S, Barzegar KB (2016) Comparison of attachment to parents, peers and siblings in the involved and noninvolved adolescents in bullying. J Fam Res 12: 369-390.