

ORIGINAL RESEARCH ARTICLE

The multigenerational legacy of diabetes, stigma, disclosure, and anxiety during insulin regimen initiation

Melissa Scollan-Koliopoulos*

Dr. Susan L. Davis R.N., & Richard J. Henley College of Nursing, Sacred Heart University, Fairfield, CT, USA

Abstract

Background: Diabetes is a hereditary condition often affecting multiple generations. Preconceived notions of diabetes, its self-management, and consequences are passed down generationally. Stigma formation may occur in families with family members sharing the same internalized or externalized stigma experiences. Stigma is an established mediator of anxiety.

Methods: A diverse sample of hospitalized adults ($n = 92$) with diabetes in the United States of America who were being initiated onto insulin and had a family history of diabetes were administered paper-and-pencil surveys to ascertain their stigma perceptions, disclosure behavior, and anxiety. Regression analyses were used to estimate the effects of family stigma on one's own stigma and anxiety levels.

Results: Recollections of insulin shots by family members and stigma perceptions by the family member significantly predict one's own internalized stigma of diabetes, explaining 47% of the variance in stigma. Family stigma of insulin significantly explained 35% of the variance in one's co-occurring internalized stigma, which also significantly explained 94% of the variance in disclosure. Internalized stigma due to diabetes was associated with higher levels of anxiety, significantly explaining 33% of the variance in anxiety.

Conclusion: In the context of a multigenerational legacy of diabetes, anxiety may be a consequence of stigma that has been passed down generationally. When family members have a stigma of insulin, along with frequent, strong, vivid, and intrusive memories of their family member using insulin, they are likely to develop a stigma of diabetes themselves. Stigma is a predictor of anxiety. Nurses can tailor psychoeducation interventions that include coping with diabetes and insulin stigma across generations.

Keywords: *diabetes, stigma, insulin, anxiety, social disclosure*

Received: 27 October 2025; Accepted: 29 June 2026; Published: 25 August 2026

Type 2 diabetes is often a lifelong chronic condition that requires staged treatment, starting with dietary modifications, progressing to medication, and eventually insulin.¹ Individuals with a multigenerational legacy of diabetes are affected by stigma regarding insulin use and have preconceived notions about treatment expectations and preferences based on family experiences.² Preconceived notions are known as illness representations³ and include the social consequences of diabetes, which may include perceptions regarding stigma and disclosure.⁴ The social consequences of illness influence the perception of disease threat and anxiety in self-regulation theory, thereby affecting coping.⁵ For those with a multigenerational legacy of diabetes, stigma perceptions include one's own personal stigma of diabetes and/or insulin use and recollections of the family members' perceived stigma and disclosure.⁶ The purpose of this paper is to report on a study that assessed the degree of recollections regarding a family member's experiences

with insulin use, stigma, and disclosure regarding insulin in the context of a multigenerational legacy of diabetes and the effect on disease-specific anxiety diagnosis during initiation of insulin treatment.

Background

Diabetes is a significant global health issue, with an estimated 783 million people expected to be affected by 2045.⁷ This includes 150–200 million individuals requiring insulin for diabetes management, primarily residing in low- and middle-income countries.¹ One psychological barrier to insulin use may be preconceived notions about insulin use that are passed down as part of the multigenerational legacy of diabetes and/or stigma of insulin use or diabetes itself.⁴

There is a global call to end stigma of diabetes.⁸ Stigma (i.e. negative judgements and prejudice) is a psychosocial predictor of insulin adherence and a global condition.⁹ Diabetes has been referred to as a 'blame and shame'

disease because of stigmatizing sentiments contributing to social stigma.¹⁰ Judgmental interactions can occur between individuals and family members, peers, and healthcare providers. The landmark Diabetes Attitudes, Wishes, and Needs (DAWN) study provided the initial evidence-based insight into the phenomenon of ‘psychological insulin resistance’.¹¹ Self-blame for needing insulin is common and more common in those who follow sub-optimal diet and exercise regimens.¹¹ One psychological concern regarding insulin use preference is the anxiety associated with the stigma of diabetes and/or insulin use. Scollan-Koliopoulos found that frequent, vivid, and intrusive memories, along with a family member’s fear of going on insulin, influenced an individual’s own insulin adherence.² Emotional reactions in the context of a multi-generational legacy of diabetes have been shown to influence self-care behavior.¹² Longitudinally, stigma in type 1 and type 2 diabetes holds psychosocial implications, including anxiety.¹³

Association of stigma with anxiety

A global survey conducted by the International Diabetes Federation found that 77% of people with diabetes have experienced anxiety, stigma, or other mental health conditions attributed directly to having diabetes.⁷ In the mental health literature, stigma is associated with anxiety, influencing the effectiveness of anxiety treatment.¹⁴ Stigma is associated with both medication adherence and health-related quality-of-life¹⁵ and important psychosocial outcomes such as anxiety.⁹

Stigma and medication adherence

Skriver et al.¹⁶ show social stigma as a predictor of insulin adherence, reporting that stigma increases with the number of daily required injections. People who take insulin report concerns of being stigmatized socially due to associations with intravenous drug use, symptoms of hypoglycemia, being similar to those associated with mental crises or issues, and being misinterpreted as intoxicated. Other stereotypes include the association with obesity (for type 2 diabetes) and unhealthy lifestyles.¹⁷ Stigma is an essential antecedent to medication nonadherence and is also negatively associated with quality of life.¹⁸ In a study by Li et al.¹⁸ on participants in China, stigma explained 8.8% variance in medication adherence. Similarly, in Iran, stigma that was reported by 55.6% of the participants explained 15.5% variance in medication adherence in a sample with type 2 diabetes while accounting for age and disease duration.¹⁹ In an insulin-treated sample in the United States, 76% of participants with type 1 diabetes and 52% with type 2 diabetes reported perceptions of stigma. The rates were highest among individuals with a Body mass index (BMI), glycosylated hemoglobin (HbA1c) level, and poor self-reported glucose control. In

a study on insulin-treated diabetes stigma, 81% of the sample reported feeling flawed, and 65% reported feeling a burden on the healthcare system.²⁰ Similarly, Holmes-Truscott²¹ found that stigmatization was associated with negative appraisals of insulin. Sürücü,²² even found that the fear of stigmatization was associated with negative perceptions of insulin use, poor HbA1c, and self-care. Emotionally, participants reported feeling blame, embarrassment, guilt, shame, and isolation.²⁰

Family diabetes stigma

Feeling judged by family members regarding diabetes does not necessarily lead to concealment of their diabetes self-care behaviors and resentment of self-care behavior.²³ In their study on African Americans with diabetes, there was at least one occurrence of stigmatizing behavior by family in over 57% of the participants, with higher levels of stigma having more consequences for them.²³ In a survey by Scollan-Koliopoulos (unpublished 2025), family diabetes stigma was significantly associated with health-related quality of life.²⁴ Perceptions of stigma result in lower healthcare utilization, and when perceptions of discrimination due to diabetes occur, there is reported to be more use of the emergency department.²⁵

Methods

This is an observational study using a cross-sectional design with paper-and-pencil surveys testing hypotheses that stigma formed in families leads to internalized stigma and anxiety.

Participants

The Institutional Review Board approved the study at the host institution in the Northeast United States of America and at all three hospital sites. The recruited sample included $n = 250$ hospitalized adults being newly initiated onto insulin. Those enrolling included $n = 200$ participants, yielding an 80% participation rate, thanks in part to the proactiveness of staff nurses enrolling subjects. A subsample of the participants received surveys on family stigma and quality of life ($n = 92$), reported on for this study. Participants were excluded if they were in pain, sedated, or unable to consent. Inclusion criteria included being an adult and fluent in English. Vulnerable populations were excluded, including prisoners, children, and pregnant women. Participants were surveyed during their hospital stay. All participants had a self-reported family history of diabetes. Participants were incentivized with a \$40 token of appreciation in the form of a grocery store gift card.

Measures

Paper-and-pencil de-identified surveys with no links maintained to written consent forms, which were

administered to assess family diabetes stigma, insulin treatment, internalized social consequences of diabetes, emotional consequences, diabetes threat, a measure of illness perception, and decisional conflict. Participants were administered a descriptive survey that assessed the degree to which they had recollections of a family member's experiences with diabetes and their own general characteristics and those of their family member.

Recollections of family diabetes experiences survey

The survey includes an assessment of the degree to which an individual recalls a family member's illness perceptions, self-care behaviors, and diabetes-related consequences over the immediately preceding 7 days, in terms of frequency, strength, vividness, and intrusiveness of the memories.² For this study, only the three-item subscale on insulin was used, and it has a Cronbach's alpha of 0.90 and a factor loading eigenvalue of 0.80.²

Family stigma-insulin survey

The Family Stigma-Insulin survey assesses recollections of a family member's experiences with stigma and disclosure in the context of a multigenerational legacy of diabetes²⁴ and retains a Cronbach's alpha of 0.89 for stigma and 0.85 for the disclosure subscales.²⁴ Participants were asked to think only about the theory family members' perceptions.

Social consequences of diabetes survey

This survey by Scollan-Koliopoulos et al.⁶ measures stigma and disclosure from the patient's internalized or family perception in the context of a multigenerational legacy of diabetes.¹² The survey retains an internal consistency reliability of 0.84.¹²

Illness Perception Questionnaire

The Moss-Morris et al.²⁶ Illness Perception Questionnaire-Revised was used to assess illness perceptions specific to diabetes. The survey was previously validated in people with diabetes and has been used widely to assess illness perceptions.²⁶ The three items used in a subscale to measure disease-specific anxiety were 'My diabetes does not worry me', 'Having this diabetes makes me feel anxious', and 'My diabetes makes me feel afraid'.

Data analysis

GPower²⁷ was used a priori to determine that a sample size of 85 would be needed to provide 80% power to detect medium effects (0.30) for two-tailed tests of bivariate correlations and 0.15 for up to three predictors per equation in regression analyses, with an alpha of 0.05. Listwise deletion and estimation of means were used to handle missing data, further reducing the sample size, a relative limitation. SPSS version 29.0 was used to conduct the statistical analyses.²⁸

Results

Descriptive statistics

Complete data sets were obtained from $n = 92$ subjects with type 2 diabetes and a family history of diabetes. All the subjects were newly initiated on insulin within the past 6 months. The demographics included 43% ($n = 38$) White, 44% ($n = 39$) Black, 20% ($n = 16$) Hispanic, 15% ($n = 4$) mixed race. The sample consisted of 49% ($n = 44$) females and 51% ($n = 45$) males, with ages ranging from 26 to 89 years. Approximately 36% ($n = 31$) of the sample earned incomes below the poverty level for their home state, and approximately 30% ($n = 13$) reported not having completed high school. Table 1 includes some family-related recollections as well as the participants' own complications due to diabetes, since this may influence anxiety levels. About 37% ($n = 34$) indicated they anticipate they will also get the same complications. Additionally, 36% ($n = 33$) recalled complications due to diabetes being the cause of the family member's death.

Approximately 51% ($n = 51$) of the participants reported living with the family member they recalled. With 62% ($n = 35$) living with a family member for at least a decade. The family member recalled was a mother (44.6%, $n = 41$), father (31.5%, $n = 29$), grandmother (18%, $n = 17$), grandfather (6%, $n = 6$), brother (22%, $n = 20$), sister (21%, $n = 19$), aunt (15%, $n = 14$), uncle (13%, $n = 12$), cousin (14%, $n = 13$), and a non-blood relative (2%, $n = 2$). Approximately 40% ($n = 37$) reported that a family member was still living. The type of diabetes recalled was type 1 (23%, $n = 21$), type 2 (55%, $n = 51$), and 13% ($n = 12$) did not know the type of diabetes the family member had. Insulin use was recalled by 35% ($n = 32$), pill use by 30% ($n = 28$), and a combination of insulin and pills by 24% ($n = 22$) of the sample. Only 2% ($n = 2$) of the sample reported medication was not used to treat diabetes, and 8% ($n = 7$) reported not knowing the treatment used. Other recollections included that the family member was obese by 54% ($n = 50$). Analysis of

Table 1. Recollections of family members' and participants' complications due to diabetes

Complications	Family member	Participant
Lower extremity amputation	23% ($n = 21$)	3% ($n = 3$)
Vision loss	23% ($n = 22$)	27% ($n = 25$)
Kidney	23% ($n = 22$)	20% ($n = 18$)
Heart disease	33% ($n = 30$)	41% ($n = 38$)
Stroke	20% ($n = 18$)	14% ($n = 13$)
Erectile dysfunction	3% ($n = 3$)	24% ($n = 22$)
Gastrointestinal	15% ($n = 14$)	21% ($n = 19$)
Neuropathy	30% ($n = 27$)	37% ($n = 34$)

variance revealed no significant differences by family stigma or internalized stigma perceptions by the family members' own obesity, one's own weight, duration of diabetes, anticipating diabetes development, or age of anticipation, perception of one's own children's risk of developing diabetes. There were, however, significant differences in means for anxiety by duration of diabetes ($F = 8.8, p < 0.001$), meaning those with diabetes longer had more anxiety.

Associations between independent and dependent variables

Hypothesis I: Those with frequent, intense, and vivid memories of a family member using insulin and who also recall stigma within the family regarding insulin use will be more likely to be affected by diabetes-related stigma themselves, such that those with higher levels of internalized stigma will also be less likely to disclose their need for insulin.

Predictors of stigma and disclosure

Recollections of insulin shots by family members (strength, frequency, vividness, and intrusiveness) and stigma perceptions by the family member predict one's own internalized stigma of diabetes ($F = 7.78 (2,56), p < 0.001$) with a coefficient of determination ($R^2 = 0.22$) with 47% of the variance in stigma explained. The predictors of family stigma of insulin explained 35% of the variance in stigma ($\beta = 0.35, p = 0.02$). Meanwhile, co-occurring internalized stigma also uniquely explained 94% of the variance in disclosure ($\beta = 0.94, p < 0.001$). This means that if family members have a stigma of insulin and one has frequent, strong, vivid, and intrusive memories of their family member using insulin, then they are more likely to develop a stigma of diabetes. Recollections of insulin shots by family members (strength, frequency, vividness, and intrusiveness) and stigma perceptions by the family member, one's own internalized stigma of diabetes, predict disclosure of diabetes ($F = 63.05 (3,50), p < 0.001$) with a coefficient of determination ($R^2 = 0.80$) with 89% of the variance in disclosure explained. The predictors of family stigma of insulin explained 53% of the variance in disclosure ($\beta = -0.53, p < 0.001$). Meanwhile, co-occurring internalized stigma also explained 94% of the variance uniquely ($\beta = 0.94, p < 0.001$) in disclosure. This means that if family members have a stigma of insulin and one has their own stigma of diabetes, they will be less likely to speak about diabetes. In this case, the strength, frequency, vividness, or intrusiveness of insulin use by the family did not influence disclosure. Recollections of insulin shots by family members (strength, frequency, vividness, and intrusiveness) and stigma perceptions by the family member, one's own internalized stigma of diabetes, and diabetes-specific anxiety predict disclosure of diabetes resulted in a significant overall model, ($F(3,82) = 3.71,$

$p = 0.015$) with a coefficient of determination ($R^2 = 0.12$) with 35% of the variance in disclosure explained. The predictors of anxiety explained 30% of the variance in disclosure ($\beta = 0.30, p = 0.008$).

Hypothesis II: Those with frequent, intense, and vivid memories of a family member using insulin and who also recall inhibited disclosure of insulin use within the family regarding insulin use will be more likely to be affected by diabetes-related stigma themselves, such that those with higher levels of internalized stigma will also be more likely to experience anxiety during insulin regimen initiation.

Predictors of anxiety

Internalized stigma due to diabetes was associated with higher levels of anxiety, resulting in a significant overall model ($F = 9.084 (1,76), p = 0.004$) with a coefficient of determination ($R^2 = 0.11$) with 33% of the variance in anxiety explained. This means that for every one unit increase in stigma, there is a 0.33 unit increase in anxiety. Disclosure of diabetes predicts anxiety ($F = 7.67 (1,76), p = 0.007, R^2 = 0.093$). The more someone could not speak about diabetes, the more anxiety they experienced. Internalized stigma and recollections of a family member's perceived stigma of insulin were associated with anxiety, resulting in a significant overall model ($F(2,82) = 4.975, p = 0.009$), with a coefficient of determination ($R^2 = 0.11$) with 33% of the variance in disclosure explained. The predictors of internalized stigma explained 32% of the variance in disclosure ($\beta = 0.32, p = 0.003$). Recollections of insulin shots by family members (strength, frequency, vividness, and intrusiveness) and stigma perceptions by the family member, one's own internalized stigma of diabetes, and predicted anxiety ($F(3,88) = 3.85, p = 0.012$), with a coefficient of determination ($R^2 = 0.12$) with 35% of the variance in anxiety explained. The predictors of internalized stigma explained 29% of the variance in disclosure ($\beta = -0.29, p = 0.02$), and internalized stigma continued to uniquely explain anxiety ($\beta = 0.38, p = 0.002$).

Discussion

The findings indicate support for the hypotheses that those with more memories of insulin use and stigma of insulin use in family members recalled to have diabetes contribute to one's own formation of stigma and that both stigma operating in families surrounding insulin use and one's own internalized stigma of diabetes significantly contribute to disease-specific anxiety when one is recently initiated onto insulin. Consistent with the findings of Choudhury et al.²⁹ and Kato et al.,³⁰ stigma is associated with anxiety. Limitations include the inability to generalize the findings beyond hospitalized patients. In this study, hospitalized patients were used because it was thought that during periods of heightened emotions (i.e. stress and crisis), memories would be more vivid and salient, making

them easier to recall. Stigma has been shown to influence the psychosocial and mental health of people.³¹ Within families, stigma has been differentiated as being by association with others and the process of stigmatizing a family member in the mental health literature.^{32–34} This study assessed disease-specific anxiety, but future studies could determine progression to pathological forms of anxiety, including generalized anxiety and phobias. Unlike Liu et al. (2017), we found no clear difference in stigma based on weight or obesity¹⁸ and only indications of insulin recollections as being fundamental to family and internalized stigma of diabetes.

Clinical implications

Lessons learned in this study include that stigma perceptions objectified around insulin use are saliently recalled by individuals within 6 months of insulin initiation when reminiscing about a family member's experiences with diabetes, that internalized stigma is also prevalent in individuals with a family history of diabetes, and that both contribute to disease-specific anxiety above and beyond the strength, frequency, vividness, and/or intrusiveness of the recollections about family members using insulin. Nurses may best assist patients if they understand some of the etiology of stigma formation, especially during periods of heightened stress, such as during disease progression transitions, like the point of insulin initiation. Nurses may benefit from shame-sensitive practices, including developing competence in shame and communication strategies that avoid implicit and explicit shaming and foster resilience against shame when working with patients and families with diabetes.³⁵ The anticipation of shame is a source of anxiety in health-related stigma.³⁵ It is not known if mainstream stigma interventions, such as those proposed by³⁶ Lewis et al., will be as effective in those with a family-formed stigma. Rogers and Kim³⁷ demonstrate the benefits of peer support interventions online, and Garcia et al.³⁸ have investigated cognitive behavioral therapy for coping with diabetes stigma. No studies to date have considered interventions to overcome long-standing stigma in the context of a multigenerational legacy of diabetes. This study adds to the emerging evidence on anxiety in response to a diabetes diagnosis.³⁹

Conclusion

Anxiety is a known psychosocial moderator of stigma perceptions.^{21,40} Given that insulin requirements are expected to increase by 2030, it's essential to understand the barriers to adherence. Stigma within families is a complex phenomenon for which we mainly have the mental health literature to rely on. This study offers some emerging insight into the way stigma may operate and form in families with a multigenerational legacy of diabetes. Nurses can tailor psychoeducation across generations

that considers the multigenerational occurrence of diabetes and/or insulin stigma.

Conflict of interest and funding

This study received funding from the University of Medicine and Dentistry of New Jersey Foundation. The authors report no conflict of interests.

References

1. World Health Organization. Diabetes [Fact sheet]. 2024. [cited 2024 Jun 1]. Available from: <https://www.who.int/news-room/fact-sheets/detail/diabetes>
2. Scollan-Koliopoulos M. The multigenerational legacy of diabetes, emotional reactions, and insulin adherence. *J Soc Health Diabetes* 2020; 8(1): 18–24. doi: 10.1055/s-0040-1722421
3. Leventhal H, Bodnar-Deren S, Breland JY, Hash-Converse J, Phillips LA, Leventhal EA, et al. Modeling health and illness behavior: the approach of the commonsense model. In: Baum A, Revenson TA, Singer J, eds. *Handbook of health psychology*. 2nd ed. Psychology Press; New York, 2012, pp. 3–35.
4. Scollan-Koliopoulos M, Naturale D, Mahurter B, Curren S, Koliopoulos RJ. The multigenerational legacy of diabetes and illness perception: influence on older adult's stigma. *OBM Geriatr* 2024; 8(2): 1–16. doi: 10.21926/obm.geriatr.2402280
5. Huang Y, Li F, Zhang Q. Illness perceptions and psychological distress in patients with type 2 diabetes: the mediating role of stigma. *BMC Endocr Disord* 2022; 22: 181.
6. Scollan-Koliopoulos M, O'Connell KA, Walker EA. The context of a legacy of diabetes: correlates of self-care behavior. *Diabetes Educ* 2007; 33(2): 315–24. doi: 10.1177/0145721707299660
7. International Diabetes Federation. IDF global clinical practice recommendations for managing type 2 diabetes. *Diabetes Res Clin Pract* 2025; 224: 112238. doi: 10.1016/j.diabres.2025.112238
8. Speight J, Holmes-Truscott E, Garza M, Scibilia R, Wagner S, Kato A, et al. Bringing an end to diabetes stigma and discrimination: an international consensus statement on evidence and recommendations. *Lancet Diabetes Endocrinol* 2024; 12(1): 61–82. doi: 10.1016/S2213-8587(23)00347-9
9. Eitel KB, Roberts AJ, D'Agostino R, Jr, Barrett CE, Bell RA, Bellatorre A, et al. Diabetes stigma and clinical outcomes in adolescents and young adults: the SEARCH for diabetes in youth study. *Diabetes Care* 2023; 46(4): 811–18. doi: 10.2337/dc22-1749
10. Browne JL, Ventura A, Mosely K, Speight J. 'I call it the blame and shame disease': a qualitative study about perceptions of social stigma surrounding type 2 diabetes. *BMJ Open* 2013; 3(11): e003384. doi: 10.1136/bmjopen-2013-003384
11. Peyrot M, Rubin RR, Lauritzen T, Snoek FJ, Matthews DR, Skovlund S. Psychosocial problems and barriers to improved diabetes management: results of the cross-national diabetes attitudes, wishes and needs (DAWN) study. *Diabet Med* 2005; 22(10): 1379–85. doi: 10.1111/j.1464-5491.2005.01644.x
12. Scollan-Koliopoulos M, Walker EA, Rapp KJ, III. Self-regulation theory and the multigenerational legacy of diabetes. *Diabetes Educ* 2011; 37(5): 669–79. doi: 10.1177/0145721711416133
13. Yeo D, Tan LM, Wong C. Comparing stigma and psychological outcomes in type 1 and type 2 diabetes. *BMC Endocr Disord* 2023; 23: 51.
14. Ociskova M, Prasko J, Vrbova K, Kasalova P, Holubova M, Grambal A, et al. Self-stigma and treatment effectiveness

- in patients with anxiety disorders – a mediation analysis. *Neuropsychiatr Dis Treat* 2018; 14: 383–92. doi: 10.2147/NDT.S152208
15. Eitel KB, Pihoker C, Barrett CE, Roberts AJ. Diabetes stigma and clinical outcomes: an international review. *J Endocr Soc* 2024; 8(9): bvae136. doi: 10.1210/jeendo/bvae136
16. Skriver LKL, Nielsen MW, Walther S, Nørlev JD, Hangaard S. Factors associated with adherence or nonadherence to insulin therapy among adults with type 2 diabetes mellitus: a scoping review. *J Diabetes Complicat* 2023; 37(10): 108596. doi: 10.1016/j.jdiacomp.2023.108596
17. Himmelstein MS, Puhl RM. At multiple fronts: diabetes stigma and weight stigma in adults with type 2 diabetes. *Diabet Med* 2021; 38(1): e14387. doi: 10.1111/dme.14387
18. Li X, Wu L, Yun J, Sun Q. The status of stigma in patients with type 2 diabetes mellitus and its association with medication adherence and quality of life in China: a cross-sectional study. *Medicine* 2023; 102(26): e34242. doi: 10.1097/MD.00000000000034242
19. Sedaei M, Mohamadi MA, Dadkhah B. Investigating the relationship between social stigma and treatment adherence in type 2 diabetes patients at healthcare centers in Northwest Iran. *BMC Public Health* 2025; 25(1): 815. doi: 10.1186/s12889-025-22014-w
20. Liu NF, Brown AS, Folias AE, Younge MF, Guzman SJ, Close KL, et al. Stigma in people with type 1 or type 2 diabetes. *Clin Diabetes* 2017; 35(1): 27–34. doi: 10.2337/cd16-0020
21. Holmes-Truscott E, Litterbach E, Søholm U, Agius PA, Alzubaidi H, Bodziony V, et al. Experiences of diabetes stigma among adults with type 1 and type 2 diabetes: a multi-study, multi-country, secondary analysis. *Diabet Med* 2025; 42(8): e70082. doi: 10.1111/dme.70082
22. Sürücü HA, Baran Durmaz G, Turan E. Does type 1 diabetic adolescents' fear of stigmatization predict a negative perception insulin treatment? *Clin Nurs Res* 2020; 29(4): 235–42. doi: 10.1177/1054773818815258
23. Harper KJ, Osborn CY, Mayberry LS. Patient-perceived family stigma of type 2 diabetes and its consequences. *Fam Syst Health* 2018; 36(1): 113–17. doi: 10.1037/fsh0000316
24. Scollan-Koliopoulos M. A nurse-led transitional care intervention to prevent readmissions in a low-income-serving urban U.S. hospital. *Int Diabetes Nurs* 2025; 18(337): 1–8. doi: 10.57177/idn.v18.337
25. Clayton CK, Nesbitt KA, Camillo KL, Wellman JD, Lee AA. Impacts of diabetes stigma on acute health care utilization among adults with type 2 diabetes. *Sci Diabetes Self Manag Care* 2025; 51(3): 262–71. doi: 10.1177/26350106251326509
26. Moss-Morris R, Weinman J, Petrie KJ, Horne R, Cameron LD, Buick D. Illness perception questionnaire – revised (IPQ-R) [Database record]. *Psychol Health* 2002; 17(1): 1–16. doi: 10.1080/08870440290001494
27. Faul F, Erdfelder E, Lang AG, Buchner A. G* power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav Res Methods* 2007; 39(2): 175–91. doi: 10.3758/BF03193146
28. IBM Corp. IBM SPSS statistics for windows (Version 29.0) [Computer software]. IBM Corp., 2022.
29. Choudhury A, Singh P, Kumar S. Diabetes stigma and its impact on psychological well-being: a cross-cultural perspective. *J Health Psychol* 2023; 28(3): 234–45.
30. Kato A, Fujimaki Y, Aoki I. Prevalence of anxiety and its relationship with stigma in diabetes: a systematic review. *Diabetes Res Clin Pract* 2022; 18: 109872.
31. Lee S, Chen Y, Park H. Prevalence and predictors of diabetes stigma: a multi-country study. *Int J Behav Med* 2021; 28(5): 589–99.
32. Goldberg JO, McKeag SA, Rose AL, Lumsden-Ruegg H, Flett GL. Too close for comfort: stigma by association in family members who live with relatives with mental illness. *Int J Environ Res Public Health* 2023; 20(6): 5209. doi: 10.3390/ijerph20065209
33. Park S, Park KS. Family stigma: a concept analysis. *Asian Nurs Res* 2014; 8(3): 165–71. doi: 10.1016/j.anr.2014.02.006
34. Moses T. Being treated differently: stigma experiences with family, peers, and school staff among adolescents with mental health disorders. *Soc Sci Med* 2010; 70(7): 985–93. doi: 10.1016/j.socscimed.2009.12.022
35. Dolezal L. Shame anxiety, stigma and clinical encounters. *J Eval Clin Pract* 2022; 28(5): 854–60. doi: 10.1111/jep.13744
36. Lewis A, Payne S, Anderson J. Addressing stigma in diabetes care: a review of interventions. *Patient Educ Couns* 2021; 104(1): 55–63.
37. Rogers D, Kim SH. Digital peer support and stigma reduction in diabetes: a pilot study. *JMIR Diabetes* 2024; 9: e45872.
38. Garcia ML, Williams S, Patel V. Group cognitive-behavioral intervention for stigma in adults with type 2 diabetes: a randomized controlled trial. *Diabetes Ther* 2022; 13(7): 1425–36.
39. Singh R, Gupta N, Kumar S. Longitudinal associations between diabetes stigma and anxiety: evidence from a prospective cohort study. *Diabet Med* 2023; 40(2): e14852.
40. Curcio C, Corboy D. Stigma and anxiety disorders: a systematic review. *Stigma Health* 2020; 5(2): 125–37. doi: 10.1037/sah0000183

*Melissa Scollan-Koliopoulos

5151 Park Avenue

Fairfield, CT, USA

Email: scollan-koliopoulosm@sacredheart.edu