

**Impact of Peer Support Group Involvement on College Students with Type 1 Diabetes**

**Mellitus**

Sydney Johnson, Author

Dr. Linda Foley, Advisor

Florida Southern College

### **Introduction**

The transition to college life can be a challenging period of time for many young adults, especially those living with a chronic illness like type 1 diabetes mellitus (T1DM). Young adults with T1DM are faced with the same age-related transitions as their peers, such as moving away from home and going off to college, with the added challenge of learning to manage their diabetes independently (Chiang et al., 2014; Pihlaskari et al., 2018). Diabetes self-care entails a variety of tasks, such as monitoring blood glucose levels regularly, maintaining a healthy diet and exercise routine, and taking insulin as prescribed. Factors related to life on campus, like sleep, nutrition, work and class schedule, and personal relationships, can have a significant impact on a student's ability to manage T1DM while in college (Kellett et al., 2018; Saylor & Calamaro, 2016). An additional challenge for young adults navigating diabetes self-care while in college is the tendency to prioritize other factors, like studying, working, or spending time with friends, over performing diabetes self-care (Lu et al., 2014; Pyatak et al., 2018).

For young adults with T1DM, the transition to college may be marked by decreased treatment adherence and poor glycemic control. Some studies have associated these poor health outcomes with an increase in psychological stress (Butler et al., 2017; Kellett et al., 2018; Lu et al., 2014; Pyatak et al., 2018). Joiner et al. (2018) found that increased stress among young adults with T1DM was associated with increased frequency of missed insulin doses and higher recorded glycosylated hemoglobin (HbA1c) levels. Additionally, young adults are at an increased risk for developing other mental health conditions, such as anxiety, depression, and disordered eating (Clarke et al., 2018). Diabetes self-care in college is both physically and psychologically demanding; and for this reason, studies have suggested that peer support for young adults with T1DM could serve as an effective intervention for improving diabetes-related

health outcomes during this transitional period in life (Ellis et al., 2019; Pihlaskari et al., 2018).

The relationship between young adults with T1DM and their peers can have a significant impact on diabetes self-care habits and feelings of diabetes distress, often times acting as either a motivator or a barrier to self-care. Diabetes distress manifests as negative emotional experiences that can develop in response to the challenges of living with T1DM. Helgeson et al. (2014) found that young adults who reported conflict with close friends exhibited poorer glycemic control, and those who reported low levels of peer support experienced poor diabetes self-care overall. Joiner et al. (2018) also identified an association between reported relationship conflict and poor glycemic control among this population. Several studies have indicated other social factors as additional barriers to self-management, such as the individual's desire to fit in or feelings of embarrassment related to diabetes self-care (Lu et al., 2014; Pyatak et al., 2014; Raymaekers et al., 2017). Raymaekers et al. (2017) found that young adults with T1DM who prioritized "fitting in" over diabetes self-care were at an increased risk for poor glycemic control during their first year of college.

While a lack of support from peers can negatively impact diabetes self-care among young adults, studies have suggested there are potential health benefits of diabetes-specific peer support for this age group. Even though close peer relationships are generally supportive, peers who provide diabetes-specific support can have a positive impact on young adults' self-management habits as well as decrease diabetes distress. Many young adults who have openly shared their diagnosis and educated their friends about living with T1DM have experienced an increase in support from their peers (Fredette et al., 2016; Raymaekers et al., 2017). Young adults with T1DM who perceive a greater amount of peer support are more likely to adhere to their prescribed treatment regimens and achieve optimal glycemic control while in college (Pihlaskari

et al., 2018). Raymaekers et al. (2017) also found young adults who felt supported by their peers experienced a decrease in diabetes related distress. Many young adults with T1DM are also interested in connecting with peers who understand their disease experience, whether they themselves have T1DM or are closely related to someone who has T1DM, through a diabetes peer support group (Balfe et al., 2013; Garvey et al., 2014; Lu et al., 2014).

Diabetes peer support groups can be facilitated in a variety of formats, but one of the distinguishing features of a group is that it's facilitated by peers for peers. Fisher et al. (2012) defined peers in diabetes peer support groups as “nonprofessionals who have diabetes or close familiarity with management” (p. 130) who can provide ongoing emotional support and guidance to others living with T1DM. Diabetes peer support groups allow young adults with T1DM the chance to achieve a sense of normalcy throughout their college experience by connecting with a community of individuals who understand life with T1DM and who seek to support one another in their experiences (Joensen et al., 2016; Saylor et al., 2016). Examples of diabetes peer support groups include those that are face-to-face, such as the College Diabetes Network, diabetes camps, or the Juvenile Diabetes Research Foundation, and those that are online, such as discussion boards, blogs, or Facebook groups. Online groups can give individuals with T1DM the opportunity to connect with each when meeting face-to-face may not be a feasible option.

Even though a variety of diabetes peer support groups exist, no studies have been identified that describe the impact that involvement in a peer support group has on self-care habits in addition to perceptions of diabetes distress among young adults with T1DM. A systematic review by O'Hara et al. (2017) examined the effectiveness of online peer support interventions in improving self-management habits among young adults with T1DM. The interventions were shown to be effective; however, they were facilitated by healthcare

professionals rather than peers. Other studies have identified the health benefits associated with involvement in face-to-face diabetes peer support groups, such as improved glycemic control, improved diet and exercise, decreased frequency of hypoglycemic events, fewer episodes of diabetic ketoacidosis (DKA), as well as decreases in stress and symptoms of depression and anxiety (Ellis et al., 2019; Saylor et al., 2018).

Although these studies show positive outcomes, no studies have been identified that have examined the impact of involvement in a diabetes peer support group on particular habits of self-care along with perceptions of diabetes distress. Measuring an individual's current habits of self-care together with perceptions of diabetes distress can provide insight into the overall diabetes self-care experience. This insight can then help to identify what interventions would be most appropriate in improving an individual's diabetes management.

This study aimed to identify the impact that peer support groups can have on college students' diabetes self-care as well as their perceptions of diabetes distress. This study was conducted to examine the following research question: How does involvement in diabetes peer support groups impact diabetes self-care habits and perceptions of diabetes distress among college students with type 1 diabetes mellitus (T1DM)? The hypotheses were: 1) College students involved in a diabetes peer support group will report higher self-care scores and lower diabetes distress scores compared to college students not involved in a diabetes peer support group, and 2) College students involved in a face-to-face diabetes peer support group will report higher self-care scores and lower diabetes distress scores compared to college students involved in an online peer support group.

### **Methodology**

This study utilized a cross-sectional design of self-reported data collected through an

anonymous online survey. Inclusion criteria for participation were being between the ages of 18 and 26 years, having a diagnosis of T1DM for at least one year, and being a current college student. Participants also had to be able to read English. Measures consisted of demographic information and completion of two questionnaires: The Self-Care of Diabetes Inventory (SCODI) and the Type 1 Diabetes Distress Scale (T1-DDS).

## **Measures**

### ***Demographics Questions***

The demographic questions included gender, race/ethnicity, current age, name of college or university of current enrollment, class standing (i.e. Freshman), age of T1DM diagnosis and most recent HbA1c value.

### ***Self-Care of Diabetes Inventory (SCODI)***

Self-care habits related to diabetes management were assessed using the Self-Care of Diabetes Inventory – SCODI (Ausili et al., 2017). The SCODI consists of 40 questions divided into the following four subscales: self-monitoring, self-management, self-confidence, and self-maintenance. The self-monitoring, self-management, and self-confidence subscales address the respondent's habits and perspectives related specifically to managing T1DM; whereas the self-maintenance subscale addresses the respondent's general health maintenance practices, such as dietary choices and exercise regimen. Responses are scored using a five-point Likert Scale, where 1 = "Never" and 5 = "Always". Respondents are asked to rate how often they perform tasks related to diabetes self-care over the past month. Higher scores are indicative of better diabetes self-care. Items numbered 8, 14, and 15 from the original SCODI were not included in

this study, as recommendations for foot care, monitoring blood pressure, and monitoring weight are not as commonly incorporated into the day-to-day management of T1DM for young adults.

### ***Diabetes Distress Scale for Adults with Type 1 Diabetes (T1-DDS)***

Perceptions of diabetes distress were assessed using the Diabetes Distress Scale for Adults with Type 1 Diabetes – T1-DDS (Fisher et al., 2015). The T1-DDS consists of 28 items divided into seven subscales: Powerlessness, Management Distress, Hypoglycemia Distress, Negative Social Perceptions, Eating Distress, Physician Distress, and Friend/Family Distress. Each subscale explores the respondent's feelings regarding burdens commonly experienced when living with T1DM. For example, the Physician Distress scale explores the respondent's relationship with their diabetes care provider while the Management Distress scale explores the respondent's perception of challenges related to common tasks associated with diabetes management. Responses are scored using a six-point Likert Scale, where 1 = "Not a problem" and 6 = "A very serious problem". Respondents select to what degree each distressing factor may have been a problem for them over the past month. Lower scores are indicative of a lesser degree of diabetes distress. For the purpose of this study and for ease of completion, the researcher modified the scale and responses were scored using a five-point Likert scale with choices ranging from 1 = "Never" to 5 = "Always".

### ***Diabetes Peer Support Group Involvement***

In this study, participants were asked to identify if they were actively involved in a peer support group for young adults with T1DM. If participants acknowledged being involved in a diabetes peer support group, they were then asked to identify the type of peer support group that they primarily interact with. The choices included face-to-face (i.e. group meetings, in-person events), online (i.e. postings, messages, emails), or both. Participants choosing "both" as an

option were asked to further identify which of the two was utilized more often.

### **Participant Recruitment**

Participants were recruited by advertising the study to a variety of campus resources as well as face-to-face and online diabetes peer support groups. An introductory letter, a flyer advertising the study, and a link to the online survey were emailed to disability service offices and health centers at 18 colleges and universities throughout the state of Florida. The survey flyer and a link to the survey were also sent directly to the student leaders in College Diabetes Network chapters throughout the state of Florida to share with their active members.

Additionally, the survey link and a brief description of the study was advertised in the College Diabetes Network's November e-newsletter, which is sent by email to all active college student members throughout the United States. To reach the online peer support community, the survey link and flyer were shared with five Facebook groups for young adults with T1DM. Survey data was collected for three months (November 2019 through January 2020).

Approval for the study was obtained from the Florida Southern College Institutional Review Board. All participants received a letter describing the study. Completion of the study indicated informed consent. The survey was online and anonymous. However, at the end of the survey, participants were invited to enter a raffle for one of two \$50 Amazon gift cards. If they chose to participate, they were taken to an outside link in which to leave their name and email address. This link prevented their information from being traced to their individual survey answers.

### **Statistical Analyses**

Descriptive analyses of demographic measures were computed. Bivariate analyses with independent samples t-tests were examined for involvement in a diabetes peer support group

with self-care and diabetes distress measures. The independent samples t-tests were two-tailed with a significance level of five percent. Analyses were run using SPSS Version 26.

## **Results**

### **Descriptive Analyses**

A total of sixty-two individuals completed the online survey. Two of the surveys were excluded as they did not meet the age range criteria. Participants were 90% female, 83% Caucasian, and had a mean age of 20.6 years. The average number of years living with diabetes was 9.4, and the mean HbA1c was 7.4% (Table 1).

Of the 60 respondents, 29 (48%) students were involved in a diabetes peer support group. Of the 29 in the support group, eight (28%) reported it being face to face, three (10%) reported being online, and 18 (62%) reported both. Of the individuals reporting being involved in both types of groups, 12 (67%) reported mostly face-to-face and six (33%) mostly online. Due to the small number of respondents that reported involvement in both, the decision was made to group them into either face to face only or online only for the analyses. This change resulted in an analysis of 20 (69%) participants involved in face-to-face and nine (31%) involved in online diabetes peer support groups.

**Table 1***Participant Demographics*

Variable	Range	Frequency (%)	Mean (SD)
Gender	Female	54 (90)	
	Male	6 (10)	
Race/Ethnicity	Caucasian	50 (80)	
	Hispanic/Latino	6 (10)	
	African American	1 (2)	
	Other	3 (3)	
Year in school	Freshman	12 (20)	
	Sophomore	13 (22)	
	Junior	13 (22)	
	Senior	15 (25)	
	5 <sup>th</sup> Year Senior/Grad Student	7 (12)	
Age in years	18-26		20.6 (2)
Years with T1DM	1-25		9.4 (5.8)
HbA1c (%)	< 7.0	23 (38)	
	≥ 7.0	33 (55)	
	Did not report	4 (7)	
Support group	Yes	29 (48)	
	No	31 (52)	

*Note.* N = 60; SD = standard deviation; T1DM = Type-1 diabetes mellitus; HbA1C = glycosylated hemoglobin level

**Bivariate Analyses***Support Group Involvement and Self-Care*

College students involved in a diabetes peer support group had higher mean overall self-care scores on the SCODI than those students not in a peer support group. This was also true

when comparing the mean scores for each of the four subscales: Self-Monitoring, Self-Management, Self-Confidence, and Self-Maintenance (Table 2). An independent samples t-test revealed there was a significant difference in ‘Overall Self-Care’ scores for those in a diabetes peer support group (M=142.41, SD=8.93) compared to those not in a support group (M=131.87, SD=16.89);  $t(46) = 3.05, p=.004$ . Independent samples t-tests comparing mean scores were run for each of the four subscales. The ‘Self-Monitoring’ subscale scores were significantly different for those in a diabetes peer support group (M= 23.03, SD=1.88) compared to those not in a support group (M=20.87, SD=3.56);  $t(46) = 2.97, p = .005$ . There was also a significant difference in ‘Self-Management’ subscale scores for those in a diabetes peer support group (M= 30.55, SD=3.89) compared to those not in a support group (M=27.71, SD=5.24);  $t(55) = 2.4, p = .02$ . Finally, there was a significant difference in ‘Self-Confidence’ subscale scores for those in a diabetes peer support group (M= 48.62, SD=3.77) compared to those not in a support group (M=44.61, SD=8.45);  $t(42) = 2.4, p = .021$ . With the fourth subscale of ‘Self-Maintenance’, no significant difference was found between participants in a diabetes peer support group (M=40.21, SD=3.26) and those not in a support group (M=38.68, SD=4.41);  $t(58) = 1.52, p = .134$ .

**Table 2**

*Involvement in a peer support group with SCODI scores*

	Yes	No	t-test
	M (SD)	M (SD)	
Overall Self-Care	142.41 (8.93)	131.87 (16.89)	$t(46.19) = 3.05, p = .004^*$
Self-Monitoring	23.03 (1.88)	20.87 (3.56)	$t(46.18) = 2.97, p = .005^*$
Self-Management	30.55 (3.89)	27.71 (5.24)	$t(55.23) = 2.4, p = .020^*$
Self-Confidence	48.62 (3.77)	44.61 (8.45)	$t(42.12) = 2.4, p = .021^*$
Self-Maintenance	40.21 (3.26)	38.68 (4.41)	$t(58) = 1.52, p = .134$

*Note.*  $\alpha = 0.05$  level of significance; SCODI = Self-Care of Diabetes Inventory; M = mean; SD = standard deviation

***Support Group Involvement and Diabetes Distress***

College students involved in a diabetes peer support group had lower mean ‘Overall Distress’ scores on the T1-DDS than college students not involved in a peer support group. This was also true of six of the seven subscales: Powerlessness, Management Distress, Negative Social Perceptions, Eating Distress, Physician Distress, and Friends/Family Distress (Table 3). Of the six subscales that had lower mean scores, independent samples t-tests revealed there was a significant difference in two. ‘Management Distress’ scores for those in a diabetes peer support group (M= 9.59, SD=3.8) were significantly lower compared to those not in a support group (M=12.23, SD=5.35);  $t(54) = -2.21, p = .031$ . There was also a significant difference in the ‘Friends/Family Distress’ scores for those in a diabetes peer support group (M= 8.97, SD=4.36) compared to those not in a support group (M=11.74, SD=5.01);  $t(58) = -2.28, p = .026$ . The subscale ‘Hypoglycemia Distress’ revealed that individuals involved in a diabetes peer support group reported higher levels of distress (M=11.10, SD=4.17) compared to those not in a support group (M=10.84, SD=4.88). However, independent samples t-tests revealed this was not a significant difference ( $t(58) = .23, p = .823$ ).

**Table 3**

*Involvement in a peer support group with T1-DDS scores*

	Yes	No	t-test
	M (SD)	M (SD)	
Overall Distress Score	75 (23.02)	85.23 (24.85)	$t(58) = -1.65, p = .104$
Powerlessness	17.86 (4.73)	18.97 (4.93)	$t(58) = -.89, p = .380$
Management Distress	9.59 (3.80)	12.23 (5.35)	$t(54.21) = -2.21, p = .031^*$
Hypoglycemia Distress	11.10 (4.17)	10.84 (4.88)	$t(58) = .23, p = .823$
Negative Social Perceptions	10.38 (5.16)	11.16 (4.72)	$t(58) = -.61, p = .542$
Eating Distress	9.21 (2.98)	10.13 (3.60)	$t(58) = -1.08, p = .286$
Physician Distress	7.90 (4.12)	10.16 (5.58)	$t(55.09) = -1.8, p = .078$
Friends/Family Distress	8.97 (4.36)	11.74 (5.01)	$t(58) = -2.28, p = .026^*$

*Note.*  $\alpha = 0.05$  level of significance; T1-DDS = Type 1 Diabetes Distress Scale; M = mean; SD = standard deviation

***Face-to-Face versus Online and Self-Care***

College students who reported being in a face-to-face diabetes peer support group had higher mean overall self-care scores on the SCODI than those students in an online peer support group. This was also true of the ‘Self-Management’ and ‘Self-Maintenance’ subscales. However, with the subscales ‘Self-Monitoring’ and ‘Self-Confidence’, the mean scores were lower in individuals in a face-to-face versus online diabetes support group (Table 4). Independent samples t-tests were conducted to determine if there was a significant difference in the ‘Overall Self-Care’ and the four subscales’ mean scores between college students involved in a face-to-face diabetes peer support group and an online support group. The ‘Self-Management’ subscale scores were the only one that were significantly different when comparing self-care in those in a face-to-face support group (M=31.6, SD=3.78) compared to those in an online support group (M=28.22, SD=3.19);  $t(27) = .233, p = .028$ .

**Table 4**

*Type of peer support group with SCODI scores*

	Face-to-face	Online	t-test
	M (SD)	M (SD)	
Overall Self-Care	143.60 (10.24)	139.78 (4.32)	$t(26.98) = 1.41, p = .169$
Self-Monitoring	23.00 (2.00)	23.11 (1.69)	$t(27) = -.15, p = .886$
Self-Management	31.60 (3.78)	28.22 (3.19)	$t(27) = 2.33, p = .028^*$
Self-Confidence	48.30 (4.08)	49.33 (3.08)	$t(27) = -.68, p = .505$
Self-Maintenance	40.70 (3.67)	39.11 (1.76)	$t(27) = 1.23, p = .230$

*Note.*  $\alpha = 0.05$  level of significance; SCODI = Self-Care of Diabetes Inventory; M = mean; SD = standard deviation

***Face-to-Face versus Online and Diabetes Distress***

College students involved in a face-to-face diabetes peer support group had lower mean ‘Overall Distress’ scores on the T1-DDS than college students involved in an online peer support group. This was also true of three of the seven subscales: Management Distress, Negative Social Perceptions, and Friends/Family Distress. The other four subscales of Powerlessness,

Hypoglycemia Distress, Eating Distress and Physician Distress revealed higher scores in college students in a face-to-face peer support group compared with an online support group (Table 5). Independent samples t-tests were conducted to determine if there was a significant difference in the ‘Overall Distress’ scores and seven subscales’ mean scores between college students involved in a face-to-face diabetes peer support group and an online support group. All the tests showed there was not a significant difference between the two groups.

**Table 5**

*Type of peer support group with T1-DDS scores*

	Face-to-face	Online	t-test
	M (SD)	M (SD)	
Overall Distress Score	76.15 (24.76)	72.44 (19.71)	$t(27) = .4, p = .696$
Powerlessness	18.10 (4.76)	17.33 (4.92)	$t(27) = .4, p = .694$
Management Distress	9.50 (4.06)	9.78 (3.38)	$t(27) = -.18, p = .859$
Hypoglycemia Distress	11.70 (4.11)	9.78 (4.24)	$t(27) = 1.16, p = .258$
Negative Social Perceptions	10.25 (5.75)	10.67 (3.81)	$t(27) = -.2, p = .845$
Eating Distress	9.50 (2.89)	8.56 (3.25)	$t(27) = .78, p = .440$
Physician Distress	8.35 (4.17)	6.89 (4.05)	$t(27) = .88, p = .386$
Friends/Family Distress	8.75 (4.4)	9.44 (4.5)	$t(27) = -.39, p = .699$

*Note.*  $\alpha = 0.05$  level of significance; T1-DDS = Type 1 Diabetes Distress Scale; M = mean; SD = standard deviation

## Discussion

The results of this study revealed that involvement in a diabetes peer support group was associated with higher mean self-care scores on the SCODI and lower diabetes distress scores on the T1-DDS. This supports the hypothesis that students involved in a peer support group would report higher self-care and lower diabetes distress scores. The mean scores for overall self-care, as well as for the subscales of Self-Monitoring, Self-Management, and Self-Confidence, were significantly higher for students involved in a peer support group. Therefore, students involved in a diabetes peer support group performed tasks related to diabetes self-care and experienced feelings of self-confidence related to diabetes management more often than their counterparts. Examples of self-care tasks scored highly by students in a diabetes peer support group included:

identifying the symptoms of fluctuating blood sugar levels; making note of potential causes of change in blood sugar levels as well as actions taken to correct them; evaluating effectiveness of those adjustments; and persisting in monitoring diabetes even when difficult. Additionally, mean scores for overall diabetes distress and scores for six of the seven T1-DDS subscales were lower for students involved in a peer support group. Scores for diabetes distress related specifically to disease management and friend/family relationships were significantly lower among students involved in a diabetes peer support group.

The results from this study support previous findings suggesting that when young adults perceive a greater amount of diabetes related support from their peers, they are more likely to adhere to their prescribed treatment regimens as well as experience a lesser degree of diabetes distress (Pihlaskari et al., 2018; Raymaekers et al., 2017). Involvement in a diabetes peer support group further provides college students with T1DM the opportunity to connect with peers on the basis of a shared diagnosis. In a support group, college students can assist one another in navigating the everyday challenges of managing T1DM and provide support in overcoming the negative emotions commonly experienced when facing the burdens of life with diabetes (Balfe et al., 2013; Fisher et al., 2012).

The second hypothesis in this study asserted that being involved in a face-to-face diabetes peer support group would have a more significant impact on diabetes self-care habits and perceptions of diabetes distress compared to being involved in an online support group. While it was assumed that students in a face-to-face peer support group would report higher self-care scores based on the SCODI and lower diabetes distress based on the T1-DDS, the results were mixed. College students who primarily interacted with peers face-to-face reported higher mean scores for overall self-care and for the Self-Management subscale of the SCODI, but mean

scores for several other SCODI subscales were lower in this group compared to the online group. Furthermore, the mean scores for the T1-DDS subscales of Management Distress, Negative Social Perceptions, and Friend/Family Distress were lower for students involved in a face-to-face peer support group, but mean scores for several of the other T1-DDS subscales were higher than those of the online group. When independent t-tests were performed, only the mean score for the Self-Management subscale in the SCODI was found to be statistically significant when comparing between the two types of peer support groups.

The inconsistencies found when comparing between the scores of students involved in a face-to-face group versus students involved in an online group may be due to the difference in sizes among the two groups. There was a total of 20 students reporting involvement in a face-to-face group and only nine students in an online peer support group. Additionally, while studies have shown a variety of benefits for involvement in either a face-to-face or an online peer support group for young adults with T1DM, there are conflicting results on whether or not involvement in one type of group is more beneficial than involvement in another (O'Hara et al., 2017). Warshaw et al. (2019) suggested that it may not necessarily be the type of peer support group that has a more significant impact on an individual's diabetes self-care, but rather the group that is of the most value to the individual.

The findings in this study indicate that peer support group involvement is associated with improved diabetes self-care scores as well as lower diabetes distress scores, especially distress related to diabetes management and social support, among college students with T1DM. These findings serve to emphasize the importance of involvement in diabetes peer support groups for young adults with T1DM, especially throughout their time in college. Members of a diabetes peer support group can provide assistance to one another in navigating the challenges of T1DM

management, act as a source of emotional support and motivation, and serve as a resource of new information that could help improve the day-to-day self-care practices of others living with diabetes (Due-Christensen et al., 2011; Esbitt et al., 2015; Fisher et al., 2012; Warshaw et al., 2019). Diabetes peer support groups have the potential to benefit college students with T1DM, whether they are currently struggling with their diabetes self-care or are simply searching for a place to feel supported in their diabetes experiences. Diabetes peer support groups can be a beneficial intervention in assisting young adults as they navigate managing diabetes independently throughout their collegiate experience (Ellis et al., 2019; Pihlaskari et al., 2018).

### **Limitations**

This study has six limitations. The first limitation is that all data was self-reported. Therefore, some responses may be influenced by social bias, or participants' inclination to select the "right" response as opposed to the response that most accurately reflects their day-to-day experiences. The second limitation is that survey questions asked participants to recall information from experiences that occurred over the last month, which can result in errors related to recall bias. Third, this study consisted of a small sample size of only 60 participants. Fourth, sample sizes for face-to-face and online peer support group involvement were largely uneven, where of the 29 students involved in a peer support group, 20 were involved in a face-to-face support group and only nine were involved in an online peer support group. The fifth limitation is that the Likert Scale for the T1-DDS was modified in this study for participants' ease of completion, which may have impacted participants' scoring. Finally, the study was conducted later in the fall semester, with students' winter break falling in the middle of the study's timeline. As fewer students were on campus, it was more difficult to recruit study participants in-person, and the majority of participant recruitment had to be conducted online.

### **Future Recommendations**

Data from this study can be utilized in the development of interventions targeted at improving diabetes self-care habits and decreasing perceptions of distress among college students with T1DM. Nurse practitioners, diabetes educators, and other healthcare professionals can utilize the results of this study to help young adults with T1DM focus on what aspects of diabetes self-care are found to be most distressing or challenging during their time in college. This can assist healthcare professionals in the development of a more personalized, and therefore more effective, diabetes care plan for the individual patient. Healthcare professionals can also utilize the results from this study to gain a better understanding of the lived experience and challenges of being a college student with T1DM. Furthermore, diabetes care clinics or college campuses can promote local diabetes peer support groups, and healthcare professionals can refer their young adult patients with T1DM to local groups for additional support in managing their diabetes.

Future research recommendations should include studies with larger sample sizes comparing college students involved in either a face-to-face or online peer support group. Additional studies should be conducted analyzing factors related to peer support group involvement, such as length of involvement or degree of involvement, and how these factors can impact participants' self-care habits and perceptions of diabetes distress. This would provide further insight into what factors related to peer support group involvement are most influential in improving diabetes self-care and decreasing diabetes distress among college students with T1DM. Qualitative studies using focus groups to explore the lived experience of participating in diabetes peer support groups would assist in further understanding reasons why interacting with

peers who have diabetes can be helpful in improving overall diabetes management among college students with T1DM.

### **Conclusion**

In conclusion, findings from this study revealed that college students with T1DM involved in a diabetes peer support group reported higher self-care scores and lower diabetes distress scores compared with students not in a support group. However, results comparing involvement in a face-to-face peer support group to an online peer support group were mixed, and the results were not significant. While the results from this study revealed that involvement in a face-to-face diabetes peer support group does not have a more significant impact on diabetes self-care habits and perceptions of diabetes distress compared with involvement in an online peer support group, it is clear that being involved in a diabetes peer support group is more beneficial to college students with T1DM than not being involved in a peer support group at all. Many college students with T1DM continue to seek out opportunities to connect with peers who are also living with diabetes. Diabetes peer support groups provide a space for students to share in their experiences of living with T1DM and serve as an appropriate intervention that can assist college students with T1DM in improving their diabetes self-care habits and decreasing feelings of distress related to living with diabetes.

## References

- Ausili, D., Barbaranelli, C., Rossi, E., Rebora, P., Fabrizi, D., Coghi, C., Luciani, M., Vellone, E., Di Mauro, S., & Riegel, B. (2017). Development and psychometric testing of a theory-based tool to measure self-care in diabetes patients: The Self-Care of Diabetes Inventory. *BMC Endocrine Disorders* 17(66), 1-12. <https://doi.org/10.1186/s12902-017-0218-y>
- Balfe, M., Doyle, F., Smith, D., Sreenan, S., Brugha, R., Hevey, D., & Conroy, R. (2013). What's distressing about having type 1 diabetes? A qualitative study of young adults' perspectives. *BMC Endocrine Disorders* 13(25), 1-14. <https://doi.org/10.1186/1472-6823-13-25>
- Butler, A. M., Weller, B. E., Yi-Frazier, J. P., Fegan-Bohm, K., Anderson, B., Pihoker, C., & Hilliard, M. E. (2017). Diabetes-specific and general life stress and glycemic outcomes in emerging adults with type 1 diabetes: Is race/ethnicity a moderator? *Journal of Pediatric Psychology*, 42(9), 933-940. <https://doi.org/10.1093/jpepsy/jsx092>
- Chiang, J. L., Kirkman, M. S., Laffel, L. M. B., & Peters, A. L. (2014). Type 1 diabetes through the life span: A position statement of the American Diabetes Association. *Diabetes Care* 37(7), 2034-2054. <https://doi.org/10.2337/dc14-1140>
- Clarke, J., Proudfoot, J., Vatioti, V., Verge, C., Holmes-Walker, D. J., Campbell, L., Wilhelm, K., Moravac, C., Indu, P. S., & Bridgett, M. (2018). Attitudes towards mental health, mental health research and digital interventions by young adults with type 1 diabetes: A qualitative analysis. *Health Expectations* 21(3), 668-677. <https://doi.org/10.1111/hex.12662>

- Due-Christensen, M., Zoffmann, V., Hommel, E., & Lau, M. (2011). Can sharing experiences in groups reduce the burden of living with diabetes, regardless of glycaemic control? *Diabetic Medicine* 29, 251-256. <https://doi.org/10.1111/j.1464-5491.2011.03521.x>
- Ellis, D. A., Carcone, A. I., Slatcher, R., Naar-King, S., Hains, A., Graham, A., & Sibinga, E. (2019). Efficacy of a mindfulness-based stress reduction in emerging adults with poorly controlled, type 1 diabetes: A pilot randomized controlled trial. *Pediatric Diabetes* 20(2), 226-234. <https://doi.org/10.1111/pedi.12807>
- Esbitt, S. A., Batchelder, A. W., Tanenbaum, M. L., Shreck, E., & Gonzalez, J. S. (2015). “Knowing that you’re not the only one”: Perspectives on group cognitive-behavioral therapy for adherence and depression (CBT-AD) in adults with type 1 diabetes. *Cognitive and Behavioral Practice* 22, 393-406. <https://doi.org/10.1016/j.cbpra.2014.02.006>
- Fisher, E. B., Boothroyd, R. I., Coufal, M. M., Baumann, L. C., Mbanya, J. C., Rotheram-Borus, M. J., Sanguanprasit, B., & Tanasugarn, C. (2012). Peer support for self-management of diabetes: Improved outcomes in international settings. *Health Affairs* 31(1), 130-139. <http://dx.doi.org/10.1377/hlthaff.2011.0914>
- Fisher, L., Polonsky, W. H., Hessler, D. M., Masharani, U., Blumer, I., Peters, A. L., Strycker, L. A., & Bowyer, V. (2015). Understanding the sources of diabetes distress in adults with type 1 diabetes. *Journal of Diabetes and Its Complications* 29, 572-577. <https://doi.org/10.1016/j.jdiacomp.2015.01.012>
- Fredette, J., Mawn, B., Hood, K., & Fain, J. (2016). Quality of life of college students living with type 1 diabetes: A qualitative view. *Western Journal of Nursing Research*, 38(12), 1595-1610. <https://doi.org/10.1177/0193945916651265>

Garvey, K.C., Beste, M. G., Luff, D., Atakov-Castillo, A., Wolpert, H. A., & Ritholz, M. D.

(2014). Experiences of health care transition voiced by young adults with type 1 diabetes:

A qualitative study. *Adolescent Health, Medicine and Therapeutics* 5, 191-198.

<https://doi.org/10.2147/AHMT.S67943>

Helgeson, V. S., Palladino, D. K., Reynolds, K., Becker, D. J., Escobar, O., & Siminerio, L.

(2014). Relationships and health among emerging adults with and without type 1

diabetes. *Health Psychology* 33(10), 1125-1133. <http://dx.doi.org/10.1037/a0033511>

Joensen, L. E., Filges, T. & Willaing, I. (2016). Patient perspectives on peer support for adults

with type 1 diabetes: A need for diabetes-specific social capital. *Patient Preference and*

*Adherence* 10, 1443-1451. <https://doi.org/10.2147/PPA.S111696>

Joiner, K. L., Holland, M. L. & Grey, M. (2018). Stressful life events in young adults with type 1

diabetes in the U.S. T1D exchange clinic registry. *Journal of Nursing Scholarship* 50(6),

676-686. <https://doi.org/10.1111/jnu.12428>

Kellett, J., Sampson, J., Swords, F., Murphy, H. R., Clark, A., Howe, A., Price, C., Datta, V., &

Myint, K. S. (2018). Young people's experiences of managing type 1 diabetes at

university: A national study of UK university students. *Diabetic Medicine* 35, 1063-1071.

<https://doi.org/10.1111/dme.13656>

Lu, Y., Pyatak, E. A., Peters, A. L., Wood, J. R., Kipke, M., Cohen, M., & Sequeria, P. A.

(2014). Patient perspectives on peer mentoring: Type 1 diabetes management in

adolescents and young adults. *The Diabetes Educator* 41(1), 59-68.

<https://doi.org/10.1177/0145721714559133>

- O'Hara, M.C., Hynes, L., O'Donnell, M., Nery, N., Byrne, M., Heller, S. R., & Dinneen, S. F. (2017). A systematic review of interventions to improve outcomes for young adults with type 1 diabetes. *Diabetic Medicine* 34, 753-769. <https://doi.org/10.1111/dme.13276>
- Pihlaskari, A. K., Wiebe, D. J., Troxel, N. R., Stewart, S. M., & Berg, C. A. (2018). Perceived peer support and diabetes management from adolescence into early emerging adulthood. *Health Psychology* 37(11), 1055-1058. <https://dx.doi.org/10.1037/hea0000662>
- Pyatak, E. A., Sequeria, P. A., Whittemore, R., Vigen, C. P., Peters, A. L., & Weigensberg, M. J. (2014). Challenges contributing to disrupted transition from pediatric to adult diabetes care in young adults with type 1 diabetes. *Diabetic Medicine* 31(12), 1615-1624. <https://doi.org/10.1111/dme.12485>
- Raymaekers, K., Oris, L., Prikken, S., Moons, P., Goossens, E., Weets, I., & Luyckx, K. (2017). The role of peers for diabetes management in adolescents and emerging adults with type 1 diabetes: A longitudinal study. *Diabetes Care* 40, 1678-1684. <https://doi.org/10.2337/dc17-0643>
- Saylor, J. & Calamaro, C. (2016). Transitioning young adults with type 1 diabetes to campus life. *The Journal for Nurse Practitioners* 12(1), 41-46. <http://dx.doi.org/10.1016/j.nurpra.2015.09.010>
- Saylor, J., Lee, S., Ness, M., Ambrosino, J. M., Ike., E., Ziegler, M., Roth, C., & Calamaro, C. (2018). Positive health benefits of peer support and connections for college students with type 1 diabetes mellitus. *The Diabetes Educator* 44(4), 340-347. <https://doi.org/10.1177/0145721718765947>
- Warshaw, H., Hodgson, L., Heyman, M., Oser, T. K., Walker, H. R., Deroze, P., Rinker, J., & Litchman, M. L. (2019). The role and value of ongoing and peer support in diabetes care

and education. *The Diabetes Educator* 45(6), 569-579.

<https://doi.org/10.1177/0145721719882007>